

Railway Age Gazette

FIRST HALF OF 1916—NO. 4

SIXTY-FIRST YEAR

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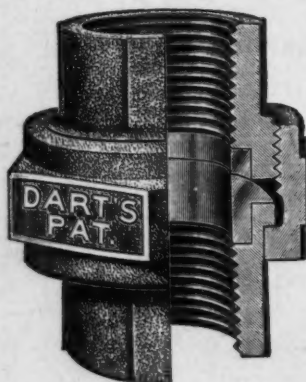
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Railway Age Gazette

Volume 60

January 28, 1916

No. 4

On Tuesday afternoon of this week the directors of the United States Steel Corporation declared a quarterly dividend of $1\frac{1}{4}$ per cent on the \$508,000,000 common stock of the United States Steel Corporation. In the fourth quarter of 1915 the company had the largest earnings of any quarter in its history. This resumption of a 5 per cent annual rate of dividends on the common stock is an official recognition, as it were, by the most influential men in American industry and finance of a return to prosperity after a period of very severe depression. The earnings available for common dividends after the payment of the preferred for the last quarter of 1915 were at the rate of over 23 per cent per year on the common stock. In the corresponding quarter of 1914 the Steel Corporation failed to earn its preferred dividends by about \$5,600,000. The finance committee of the United States Steel Corporation consists of Elbert H. Gary, chairman; George F. Baker, James A. Farrell, Henry C. Frick, J. P. Morgan, George W. Perkins, Percival Roberts, Jr., and Peter A. B. Widener.

Resumption of Steel Dividends

The question, how to give advice on "safety-first" without causing ill feeling, which was put up to our readers in the prize-offer printed November 19 last, is answered in part on another page of this issue. To learn "what the other fellow said" was a main object in our request for dialogues, and we are here told, in vivid language.

Three Safety-First Prize Papers

While the three ten-dollar prizes go to the three articles now printed, these three do not by any means contain all of the good points brought out; there are a half dozen other articles to be published in later issues. Some of these miss the prize, not because of inferior quality, but because they do not strictly comply with the conditions of the competition. The salient lesson brought out by these little essays is the same as that which is generally developed in the study of any branch of the art of impressing one's views on another person by word of mouth: prepare; or, using the latest catch-word, "preparedness." Mr. Snider, speaking to his committeeman, says "think it over." Another contributor says "carefully scrutinize" your idea before you try to impart it to another. A third says "put it on paper," so that the unwilling employee may study it over when he gets home. Giving undesired advice can never be classed as an easy task; but it need not be an uninteresting one.

William L. Saunders, chairman of the board of the Ingersoll-Rand Company, in an address before the New York Trade Press Association on Thursday of last week, outlined in a few words a program of correlating and marshalling the manufacturing resources of the United States, that in its simplicity and clearness was very impressive. Coming as it did from a man who is one of the directors of vast commercial and manufacturing enterprises, among them the International Harvester, it carried the ring of practicability. Mr. Saunders suggested that as a pre-

liminary step an inventory should be taken of the manufacturing resources of the United States with a view to determine how these resources could be on a moment's notice turned to the manufacture of munitions. Such an inventory would show the deficiencies. These should be eliminated by the government's placing small orders with a large number of shops throughout the country for munitions, thus making it possible for the small as well as the large manufacturer to have a part of his force and a corner of his shop, as Mr. Saunders put it, trained to do the work of the manufacturing of munitions and ready at a moment's notice to supply the skill and training necessary for this kind of manufacture. Mr. Saunders' suggestion was only in regard to private manufacturers, but investigation along this line might demonstrate that it would be practical also to follow out somewhat the same program for some of the largest railroad shops. With the fluctuating demands now put on railroad shops it is a serious problem to keep intact an organization. The manufacture, at slack times, of even small orders for the government might well help to remedy this situation.

Tests of reinforced concrete do not excite the interest that they called forth ten years ago. At one time almost everybody was making tests, but work of this kind is now restricted almost entirely to the laboratories of the engineering schools and is directed largely along distinctly specialized lines. This has been brought about by the

Unsettled Points in Slab Designs

fact that the general principles of reinforced concrete and the properties of the materials used have become pretty thoroughly understood. There is, however, a definite need for certain tests of reinforced concrete slabs used in railway structures, not to determine the theory of stresses in concrete reinforced with steel, but rather the distribution of the loads from the track to the slabs. This applies particularly to the ballast floor slabs commonly used on deck plate girder spans. These slabs are generally 13 to 14 ft. wide and span transversely between the tops of two girders, usually 7 ft. to 8 ft. apart, so that they have an appreciable overhang on each side. Sometimes these slabs are cast in one piece from end to end of the girder span, but more often, for the purpose of using the "precast and set" method of construction, they are builtin units, resulting in transverse joints at intervals of 4 ft. to 6 ft. along the girder span. Given a definitely applied load the design of these slabs would be simple, but under existing circumstances it is largely a matter of approximation, because the distribution of wheel loads through the rail, ties and ballast to the slabs is only a matter of conjecture; furthermore, with moving loads the maximum loading occurs repeatedly on the transverse edges of the slabs, introducing the additional factor of eccentricity. Tests have been and are being made on ballast pressures, but there is little hope that these tests will provide data of sufficient accuracy to be of value in slab design, and in any event the matter of eccentricity still remains to be solved. In general the design of slabs spanning longitudinally between piers, like those used in concrete trestles or in track elevation subways, present fewer elements of uncertainty, particularly if the slabs are provided

in units of a width such that each track is supported by a single slab. However, the necessity for limiting the weight of the individual units has resulted in the common practice of splitting the slabs on the center line of the tracks so that they will be 6 ft. or 7 ft. wide instead of 12 ft. to 14 ft. in width. It is also common usage to provide the outside slabs with a parapet or curb cast monolithic with them and extending from 1 ft. to 3 ft. above the top surface. As a result of these practices various uncertainties are introduced into the design. Owing to the eccentricity of the loading the portion of the slabs nearest the center line of the tracks carries a much larger proportion of the load than that under or beyond the ends of the ties. Just how much it is impossible to say because the mathematics or theory of the combined action of flexure and torsion is too involved and complicated to be available for practical use at this time. Tests, therefore, seem to be the only solution, and considering the nature of the subject it would seem that the results should be expressed empirically rather than to attempt analytical deductions. In other words, it would seem preferable to express them in coefficients to be applied to the equivalent load uniformly distributed. Needless to say such tests, to be of real value, must approximate as closely as possible the actual conditions existing in the track. Aside from the theoretical considerations referred to above, the need of such tests is illustrated by the wide disparity in actual designs, particularly of the ballast decks, on different railroads, indicating that these uncertainties are appreciated by the various designers, but that the exercise of judgment in providing for these uncertainties runs along widely varying channels. Structural engineers as a class are conservative, hence the rewards for tests of the character outlined above will be in the way of greater economy rather than greater safety.

WHAT AN "EIGHT-HOUR DAY" IS

IN its issue for November 12 last, the *Railway Age Gazette* published an editorial entitled, "What is an Eight-Hour Day?" This question was raised because, as was then pointed out, the brotherhoods of train employees were starting a movement which they represented to the public was one for an eight-hour day, but which, apparently, was directed toward securing, not a reduction of their working day to eight hours, but a large increase in their hourly rates of pay and in overtime payments.

The question asked at that time has been answered; and it may now be stated on the highest authority that the brotherhoods are *not* seeking an eight-hour day, as it is understood in any other line of industry, but another big increase of wages in the guise of an eight-hour day.

The question has been answered in two ways. First, it was answered most frankly, directly and explicitly in an editorial in the *Railroad Trainman* for December. This journal conceded that practically no train employees are now working more than 10 hours for a day's wage, while most of them are working less than this, and many of them less than eight hours. Those in passenger service work less than eight hours, and in most cases less than five, and often as little as four or even three hours. The *Railroad Trainman* says emphatically that while employees who are on a 10-hour basis ask to be put on an eight-hour basis, with no reduction in wages per day, and an increase of 50 per cent in the rate for overtime, the movement does not contemplate that those who are now working less than eight hours, and often much less, shall have their working day increased to eight hours. "So far as the Brotherhood of Railroad Trainmen is concerned," says the *Railroad Trainman*, "It asks for the *maximum* eight-hour day; if it can do eight hours' work in less time it wants the pay for doing it." (The italics are ours.)

The second way in which the question has been answered has been by the submission to the train service employees of the exact demands which it is proposed by their leaders shall be submitted to the railways. These proposed demands, as given in full in our issue for January 14, have one unexpected feature. Contrary to the original plan, they ask nothing on behalf of any

of the employees in passenger train service. The question naturally arises as to why this is? Doubtless it is because, as was pointed out in the editorial in our issue for November 12, the passenger train employees already are working less, and in most cases, much less than eight hours for a day's wage, and, therefore, it is considered good strategy, from the standpoint of the brotherhoods, to eliminate them, if possible, from the discussions of their movement, and should their demands ever go to arbitration, from the evidence introduced at the hearings.

But can the passenger train employees be eliminated from consideration by this very simple and obvious device? They are in train service just as much as the freight train employees are. They are employed by the same railroads on the same lines, and their wages and conditions of work are determined by the same schedules. Promotions are made directly from the freight into the passenger service, largely according to "rights" in respect of seniority acquired in the freight service. As a brakeman is in a relation of apprenticeship to a conductor, and a fireman to an engineer, so are freight train employees to passenger train employees. The freight train employee looks to advancement to the passenger service, with its shorter hours and larger pay, as a reward for the work done by him in freight service. How, then, can the hours of work and wages in passenger service reasonably be disregarded in considering the hours of work and wages to be fixed in freight service. The freight and passenger train employees are so clearly recognized by themselves as belonging to the same crafts, that they belong to the same brotherhoods and meet in the same lodge rooms. Suppose a strike should be declared because the demands now being voted on were refused? Would or would not the passenger train employees then be ordered out, along with the freight train employees?

The decision of the leaders of the brotherhoods not to include the passenger train employees in their demands is simply an indirect admission that they are not asking for a real eight-hour day, while at the same time they continue to talk about the "eight-hour day," apparently for the purpose of misleading the public, which is not familiar with the conditions in railway service, nor with the dual miles-and-hour basis on which wages in train service are fixed.

The *Railroad Trainman* says if the trainman "can do eight hours work in less time," he "wants the pay for doing it." Uninformed persons naturally will inquire how a man can do eight hours' work in less than eight hours. In all other lines of industry the "eight-hour day" means that before a man can draw pay for an eight-hour day he must work eight hours. The explanation, of course, is that in railway train service wages are based on *miles* run, as well as *hours worked*, one basis of a day's pay being 100 miles run; and what the *Railroad Trainman* means is that if a man works on a train which runs 100 miles in 6, 4 or even 3 hours, he should be considered to have "done" eight hours work. But why should he be considered to have done it? Why should wages in all other lines of industry be based on facts, and in the railway industry on a fiction?

In other words, to get right down to the meat of the matter, if the present basis of wages in railway train service is wrong, and should be changed from 10 to 8 hours, why not change it to a real eight-hour basis for all train service employees, instead of, as the brotherhoods propose, to a basis in which the "eight-hour day" would be a pure fiction? There may be some reason for an arrangement under which, after an employee has served an apprenticeship working in freight service a maximum of 10 hours for a day's wage, he is, when promoted to passenger service, required to work only four to six hours for a day's wage; but there can be no justification for demanding that eight hours be made a *maximum* basis in freight service after which overtime shall begin, unless it is also to be made a *minimum* basis in all service.

The *Railway Age Gazette* has called attention to the fact that if the increases in wages being demanded are granted the public will have to foot most of the bill, which, it is estimated, will be

at least \$95,000,000 a year. The Railroad Trainman is frank regarding this, also. It says the employees "are perfectly consistent in believing it is only fair that the public stand its proportion of cost for the shorter working day, exactly as it does for everything else that contributes to its comfort and welfare." Where, in the demands of the employees, is there a demand for a "shorter working day"? There is no such demand in them. What they ask for, is not a reduction in the number of hours they work, but a reduction of 25 per cent in the number of hours they must work *before they will begin to draw pay for overtime*, and an increase of 50 per cent in the overtime rate. Val Fitzpatrick, vice-president of the Brotherhood of Railroad Trainmen, has said: "Under such a system as that proposed (by the brotherhoods) *there is no limit to the hours that may be worked.*" Will the public consider it fair, after all the increases in railway wages granted within the last 10 years, that it be called upon to bear its share of an increase of 25 per cent in the hourly rate of pay of the best paid classes of workmen in America, and an increase of 87½ per cent in their hourly pay for overtime?

That the brotherhood leaders are not confident as to the justice of their demands is indicated by the fact that they are constantly declaring that they will not submit them to arbitration, but will call a nation-wide strike, and tie up all the industries of the country, if the railways do not grant them. In the opinion of the *Railway Age Gazette* that is the best thing for the railways and the public that could happen. Such an act of besotted madness would compel the enactment by Congress of a law making compulsory the arbitration of railway labor disputes before strikes could be called, and the abolition of the constant menace of railway strikes would be worth all that the temporary tie-up of the roads would cost.

NEW BOOKS

Finance, Business and the Business of Life. By B. C. Forbes, business and financial editor *New York American*. 339 pages. 5½ in. by 8 in. This is a collection of articles that have appeared in Mr. Forbes' daily column in the *New York American*, dealing with various phases of finance, investment and thrift from the public standpoint and with particular reference to the relations between capital, labor, the government and the public. Many of them relate to different aspects of the railroad business and to men prominent in the railroad field. Mr. Forbes' articles display a very broad grasp of the various problems which he discusses, and present many of the controversial questions regarding business and financial matters in a fair and broad-minded way and from a common-sense viewpoint which has commended them to many readers of all classes. Moreover, they are written in a breezy, snappy style not only calculated to attract readers but to emphasize the points made in an unusually effective way, which can hardly fail to have exerted a powerful influence in bringing about a better popular understanding of many questions affecting "big business."

Several of the articles show how the leaders in railroading and in the financial and industrial fields have won their way to the top from humble beginnings. Others give interesting facts regarding the number of employees and stockholders of the railroads and their relative interest in railroad prosperity. It is a very readable book.

General Foremen's Association Proceedings. Edited by William Hall, secretary of the association. 269 pages. 91 illustrations. 6 in. by 9 in. Bound in paper. Published by the association, William Hall, secretary, Winona, Minn.

This book is the official report of the eleventh annual convention of the International Railway General Foremen's Association, which was held at the Hotel Sherman, Chicago, Ill., July 13 to 16, 1915. It contains the following papers, with the accompanying discussions as presented at the meeting: Valves and Valve Gearing; Rods, Tires, Wheels, etc.; Shop Efficiency; Roundhouse Efficiency and Oxy-Acetylene Welding. The paper on Valves and Valve Gearing is one of the most complete ever presented to the association.

Letters to the Editor

"WROTE SARCASTIC"

STATECAPITOLVILLE, U. S. A.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Rarely have I been so startled as to find you quoting, with evident approbation, the Ardmore (Okla.) newspapers' laudation of the Santa Fe's "generosity and humanity" in paying \$500,000 respecting damage by an oil explosion not demonstrably its fault.

Are you ignorant of fundamental truths? Don't you know that railroad funds are wrung from the public through taxation in the form of tariff rates? and hence that such moneys are impressed with a trust? and therefore that such a voluntary payment is nothing better than a donation, nay, is a wilfully improper diversion of corporate funds?

Hence this vast sum, which should have been applied to betterments, has gone beyond recall; and the public must be mulcted of a like sum, to be obtained by further taxation through freight rates or by the burden of securities issued.

Moreover, there is an obviously unlawful discrimination between localities similarly situated. The Santa Fe did not accept responsibility for the Eastland disaster at Chicago, nor for the destruction of the Galveston causeway. Both Chicago and Galveston are served by the Santa Fe, and they should insist upon even-handed treatment.

How can you edit your paper and remain unaware of these basic principles is beyond the comprehension of

P. S. COMM.

SOMETHING WRONG WITH SAFETY FIRST

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Sometimes a great movement that is productive of much good to humanity is partly nullified by too much praise and too much advertising. Such would seem to be the case with safety first. Surely no sane person will deny that this is a great movement and that it has saved many lives and prevented many injuries, but it has been so extensively advertised that it is becoming a byword instead of a great movement.

To illustrate the case consider some incidents which have recently been noticed near New York. Safety first notices are posted in all sorts of places—both appropriate and inappropriate.

At many suburban stations passengers first read the signs, then climb over unprotected tracks to get to their trains. At many of these stations the tracks are not even filled in between the rails. One morning a few days ago a lady stepped on a slippery rail at one of these stations, fell and was seriously injured.

A large manufacturing plant located alongside of a railroad has the path, over which all employees pass in and out of the works, leading directly out over the railroad tracks. There are no gates nor protection of any kind except a notice reading "Safety First." Last week an employee walked out in front of a train and was killed.

A short time ago one of the piles in a ferry slip came loose at the top and stuck out into the slip. This loose pile was noticed at 1 p. m., but may have been in the dangerous position long before that hour. At any rate the boats dodged the pile during the daylight, but in the dark that night a boat ran into it and several persons were injured. Yet the boat and the ferry house bear numerous signs reading, "Safety First."

At one of the large freight yards brakemen may be seen every day risking their lives by winding up the brakes by sticks thrust through the brake wheels. This danger could be overcome by providing the brake rigging with adequate leverage.

One railroad recently completed a new station at a point 59 miles out of New York. The station is well appointed in every way and has passageways leading under the tracks to the train platforms. Of course, these platforms are the old-fashioned low variety. Passengers climbed up to the stage coaches from the roadside, therefore they must climb up to the trains in a similar manner. However, the low platforms are not the serious defect. The stairways are not central with the platforms, and the houses over the stairways leave a very narrow passage on one side and a wide passage on the other. Evidently the railroad considers the narrow passage unsafe because it has partly blocked off each end with signs reading, "No Passage This Side." Yet a perfectly good although narrow platform invites a passenger to pass. The signs only increase the danger by forcing any one who wishes to pass to crowd around their ends. If some of the higher officers of that railroad could see people squeeze between those signs and moving trains, it would make their blood run cold. In order to see the sight all they need to do is to visit the station when the 4:15 p. m. train comes in.

Other incidents could be cited, but perhaps these are enough to start some one thinking, so that there will be fewer signs and more action.

C. J. MORRISON.

THE DISTRIBUTION OF EMPTY CARS

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Chicago.

The railroads are not likely to be troubled with a surplus of cars in the near future, nor with conscientious scruples about the use they now make of them, but the time will come when the supply is greater than the demand, and then the roads will, of course, do as they have in the past, generously surrender the cars to their owners, who will be expected to put them in repair for another campaign. Then we shall hear again the cry of great economic losses caused by the back-haul of empty cars, whereby they make thousands upon thousands of unnecessary miles in returning to their owners. Then the old questions of abuse of cars and the necessity for enforcing car service rules will be agitated with greater vehemence perhaps than ever, with the usual results that nothing will be done either in the transportation or mechanical line to better the situation in the future.

The American Railway Association has made many attempts to regulate the use of cars; the code of car service rules has been pieced and patched until it now represents the craziest quilt of impossible theories, uncertain requirements and ambiguous intentions ever strung together by any body of men attempting to legislate on questions involving such complex problems, irreconcilable views and conflicting beliefs.

During the past summer the American Railway Association appointed a special committee to consider such questions and endeavor to suggest some remedy for the inequalities existing in the car supply. Two meetings were held, but they were unable to reach a solution of any of the problems presented, and after making a few more amendments to the car service rules, which further obscured and beclouded their intent and purport, they adjourned sine die.

Instances brought forward at the meetings above mentioned to illuminate and strengthen arguments were facetiously termed "horrible examples" by one of the representatives present, and while this may not be of much importance as an abstract proposition it becomes a significant and important fact in considering the difficulties in the way of applying remedial measures to a bad situation in a community of interests, because so wide a divergence of views among individuals is a fatal stumbling block to reform.

The practice of using foreign cars in common is of long standing and a difficult one to get away from, and there are good grounds for believing the interests of the railroads are promoted thereby. At the same time it scatters the cars throughout the length and breadth of the land, and when the demand

falls off then comes the difficulty of getting them home, because of the practice of returning them empty by indirect routes instead of direct routes, and that is where so much unnecessary mileage is created.

Returning foreign cars empty to the road that owns them is another phase of car distribution that the roads cannot entirely get away from, no matter what method is adopted for handling them; excess tonnage in one direction or another and the different classes of special equipment are the controlling factors in that problem.

The present situation of the western lines probably affords a better idea of the manner in which equipment is distributed regardless of the wishes or intentions of the railroads. The tonnage eastbound is much heavier than the westbound, and the cars are drifting away from western lines in such a constantly increasing number that if the movement is not soon reversed western lines will face the necessity of restricting the use of the equipment they are able to get hold of to their local requirements.

What is needed in such a situation is an authority over all the railroads strong enough to enforce its mandates to maintain an equalization of carrying capacity on all railroads, and until such a scheme as that is adopted great economic losses to the railroads will inevitably result, and the traffic of the country will be badly hampered for want of cars.

This means nothing more nor less than the distribution of empty cars to offset the distribution of loaded cars, over which the movement of traffic exercises full control in seasons of great activity when the car supply on all lines is fully absorbed, and the redistribution of empty cars to the owners when it is necessary to return them in order to provide for future requirements as well as to relieve the railroads of unnecessary per diem expense.

This also means the supervision over the repairs of cars. The policy of neglect in making repairs now so prevalent throughout the country should be one of the reforms that ought to be instituted by common consent.

TRANSPORTATION OFFICER.

ABOLISHMENT OF COTTON PLATFORMS

HAILEYVILLE, Okla.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The superintendent of the Indian Territory division of the Chicago, Rock Island & Pacific is making an effort to do away with cotton platforms, and is meeting with fairly good success. Many thousands of dollars are invested in these structures in the cotton loading territory and the repairs every year amount to a large sum. The real objection to them, however, is the danger of fire from passing trains and other causes. Then, again, they are used as storage places by shippers. There is no more reason why the railroads should furnish platforms of this character than there is why they should furnish granaries for wheat and corn. Cotton can be loaded from the wagon to the car a great deal easier than grain.

If all the railroads in the cotton territory would unite in this effort there is no reason why they could not be relieved of the expense of maintaining these structures. Another thing in favor of this move is that a reduction in the number of structures along the track will lessen the number of personal injuries, as there is always a chance for some trainman to be caught between a building and moving cars while switching.

J. L. COSS.

Dispatcher, Chicago, Rock Island & Pacific

BELGIAN BRIDGE REPAIRED BY GERMANS.—An Amsterdam paper reports that after more than a year's work the Germans have now succeeded in repairing the piers and electric machinery of the railway bridge blown up by the Belgians, which forms a connecting link between Antwerp and Ostend. It is now being exceedingly strongly guarded and defended.

How to Give Advice About Safety-First

Three Best Dialogues Submitted in Prize Competition; Shop Work, Train Operation and Outdoor Work

SMILES AND DIPLOMACY

By Clarence Bon Snider

I am C. B. Snider, master painter and president of the Central Safety First Committee of the Missouri, Oklahoma & Gulf at Muskogee, Okla. I have had about twenty years' experience in different branches of railway service and have made a careful study of the Safety-First proposition; and the result of that study, to myself at least, has been of great value. It has made me observant of the rights of my fellow men and tolerant of their shortcomings. It has also led me to more closely inspect my own actions and desires, and the motives leading to each act. If a Safety-First committeeman makes enemies, it is his own fault. A committeeman first must be master of himself, and before cautioning a workman he must place himself in that workman's place (mentally, of course); then study his man and approach him in the right way.

Too many committeemen overestimate their own importance because they carry an annual pass. They will approach a fellow workman and demand that a certain defect be at once remedied and hint at what the management would do to such a careless fellow. Now, the mere fact that this committeeman carries an annual pass is enough to arouse the jealousy of his less fortunate fellow workmen and cause them to antagonize any suggestion he may make. To overcome this antagonism a committeeman should be big and generous of nature with his heart and soul in the work; and above all things, he must have infinite patience and always wear "the smile that won't come off."

There comes to my mind the case of a committeeman who came to me and reported a boilermaker and his helper for shearing off rivet heads with a swedge and sledge hammer in the machine shop, without placing a fender to stop the flying fragments.

My talk with the committeeman was about like this:

Myself.—Who is cutting off rivet heads without placing a guard?

Committeeman.—Oh, that d— fool Smith.

M.—What did you say to him?

C.—I told him he'd better quit cutting them ribbits until he put up a guard, if he didn't want to get canned.

M.—Where is this work being done?

C.—North end of machine shop.

M.—All right, Al; I'll look this matter up; and I want you right near me when I talk to Smith; but you mustn't let on that you hear. You pay close attention and tackle your next man as I tackle Smith.

I walked in at the big door and down the main aisle, being careful to take my time and appear unconcerned. I even stopped at one or two machines and chatted with the machinist about the weather, his work, our work, and "Safety First."

Then I eased up to Ed Smith and stopped.

Myself.—Hullo, Ed.

Ed.—Hullo.

M.—Ed, don't you think you ought to have a guard in front there so those rivet heads couldn't fly?

Ed was on his knees holding the swedge, but he dropped it and leaped to his feet, and his face was flushed with anger.

Ed.—By God! Mr. Snider, have I been cuttin' rivets 25 years for nothin'? Has Tom been strikin' for me four years and don't know when to hit light?

Ed dropped to his knees again, and picking up his swedge he placed it against a rivet head and said to his striker, "Give 'er hell, and make 'em fly."

Myself.—Just one minute, Ed.

Ed.—Well, what is it?

M.—Ed, I have known you two years, and you have been my friend; and I have watched you work and I know that you won't hurt anybody with those rivet heads; but the rivet heads are dangerous if they all stay within three feet of where you are sitting.

Ed.—I'd like to know how in hell you make that out?

M.—Well, most of those fellows on the machines are new here, they don't know you as well as I do and are naturally nervous. They have met so many bum boilermakers that they don't know a good one when they see him. Being nervous, they might pay too much attention to you and not enough to their own business. This might result in their getting caught in their own machine, and killed or crippled. If they did get killed or crippled it would be your fault, Ed Smith; and lots of trouble for me.

Ed.—Mr. Snider, I had not thought of that at all. Of course, I ain't sorry for nothing; I can cut rivets till hell ain't bigger than a gnat, and never hurt anybody, and I hate to have anybody think I can't. But them new guys ain't to blame for what they don't know, so I'll put up that fender, right now, so they'll let you alone.

The fender was put up and the incident was closed, so far as Ed Smith was concerned. The committeeman followed me out of the machine shop and said, with a wide grin, "Mr. Snider, you can take it from me, that was the best line of soft soap I ever heard handed to a poor ignoramus." "No," said I, "Ed is no ignoramus; it is you who have played the fool. Your head is swelled, and that is why Smith refused to put up the fender for you. *Think it over.*"

Now, let me make it clear that throughout my talks with both the committeeman and Ed Smith I wore the "smile that won't come off."

SYMPATHY AND PROMPTNESS

By B. C. Cooper

Train Master, Vandalia Railroad, Logansport, Indiana.

As a trainmaster and chairman of a sub-committee connected with the department of a safety organization, it is a duty to personally admonish employees who are observed violating the rules of safety. There are a few principles which may be called fundamental. To secure results it is absolutely necessary to know your man. I do not mean that you must know him familiarly, or personally; but the idea is to think of him as he really is; live in his atmosphere; do what he is doing and as he is doing it; then have someone tell you to stop. How would you want it done? Your answer is the very way in which you must rebuke the man at fault.

When an employee is noticed violating the rules of safety, get to him. He must have knowledge of your presence. Then command him to stop—not as a soldier, a slave or a culprit; nor as a child or an irresponsible person; but *stop* he must—and by right of your authority, if need be. Then follow immediately with a few words indicating why he must stop to save life, personal injury and resulting grief to his loved ones and the loved ones of his fellow workmen. *There must be sympathy between you and him.* Follow with a few pleasant words, illustrate your point by an incident, or relate a story, if necessary; do anything to get your man thinking; and then the results are positive.

John, a car repair man, knocks a cleat from a car door. The piece flies to the ground, alighting so as to permit several sharp, vicious wire nails to protrude upward. John continues working, paying no attention to his supposedly harmless "flying chips."

By a few quick steps the trainmaster—who is in the vicinity

of the repair track—approaches John, and, to make himself heard above the resounding blows of John's hammer, shouts: "Say, my man! Stop that! Don't do that! You, I mean! Stop!"

John, leaving off his work, turns around and is surprised to learn that he is the one addressed; and, with a look of resentful astonishment, asks: "Who? Me? Are you talking to me? Stop? Stop what?"

"Now, my good fellow, listen to me," says the trainmaster, avoiding John's question. "You can't afford to take a chance. You can't afford to hurt anyone. You——"

"What am I doing to hurt anyone?" interrupts John.

"I am going to ask you," continues the trainmaster, "would you want to be responsible for yourself or some other poor fellow being seriously, or, perhaps, fatally injured? Just think of the distress, the grief, the anguish that would be brought to your firesides."

"Why, what do you mean?" demands John, with a look of contempt.

At this juncture Bill, a fellow workman, in the regular performance of his duties, comes around the end of the car, whistling, and manifesting the happiness that comes from being contented with his job and from the thought that he is earning bread and butter for the loved ones at home. His whistling suddenly ceases, his face takes on a painful expression and he winces slightly as his foot comes in contact with the trap unwittingly set by John. A speedy examination follows which, fortunately, reveals the fact that the injury is but a slight scratch. The grim possibilities, however, bring John to a realization of the gross carelessness of his act. Bill has children at home. Severe injury would have meant loss of time; loss of time would have meant lost income; and as John turns his half-embarrassed, half-apologetic gaze upon Bill, the disappointments and heartaches of Bill's children, on finding empty Christmas stockings, loom big in John's mind.

It is not necessary for John to again ask the trainmaster why he interfered; but, with his toil-stained hands sunk deep in the pockets of his overalls, he leans back against the car, near Bill, and waits for the trainmaster to speak. A rough rebuke is uppermost in John's mind, but, instead, the trainmaster places his hand gently on John's shoulder and says:

"John, the other day, I saw a fellow running down the street, when a man just ahead stopped him and asked: 'Why the excitement? What are you running for?' The fellow, between gasps, managed to inform his questioner that he was running to stop a fight. The man, curious of course, wanted to know what the fight was about, and the fellow, looking nervously back in the direction from which he had come, replied in a breathless whisper: 'Be-be-between me and another fellow;' and he broke away, resuming his flight."

Then with a slight reference to the duty of every man to promote his own safety, which is intended for Bill, the trainmaster turns and walks away.

There is a John and a Bill in every department.

It won't take long for them to understand the company's reason for getting out of breath in trying to stop trouble, by protecting employees against themselves.

Result: wide-awake employees. Interest and welfare of the company, themselves and their fellow workmen uppermost in employees' minds; pleasant relations between officers and employees.

A SHORT LESSON FROM IDAHO

By a Conductor on the Oregon Short Line

A certain water tank was situated about ten car lengths west of a busy public crossing in a small town. An eastbound train stopped to take water at this tank. The engineer attended to the spout in order to allow the fireman to get a lunch. As soon as he had finished taking water he started the train toward the crossing and started the bell ringing, and then commenced putting in a fire. The fireman had not returned and there was no

one else on the engine. I was conductor on another train and did not know this engineer. I saw that he was going to pull over this crossing at a speed of about 15 miles an hour without even looking ahead to see if the crossing was clear, so I climbed into the cab, got on to the engineer's seat and eased off on the throttle, which was wide open. When the engine was over the crossing I said:

"Brother, you are doing a very dangerous thing."

"What do you mean?"

"You are pulling over that crossing without even looking to see if it was clear."

"That may be true; but what business have you got to get on this engine and on my seat box?"

"Possibly none; but suppose I had stopped in time to avoid killing a man while you were putting in that fire? Would you have any kick coming then?"

"No, I wouldn't. You are right. I will never pull off a stunt like that again."

THE SECURITIES BILL SIDE-TRACKED

By W. L. Stoddard

Light on the way the Senate side-tracked the bill for the regulation of the issue of railway securities was thrown by several senators in the course of debate in the Senate this week. The upper chamber has had under consideration the Newlands resolution for a joint committee or commission to study matters of railroad legislation. In response to a question from Senator Norris of Nebraska, Chairman Newlands of the interstate commerce committee, told why the securities bill was allowed to die.

According to Senator Newlands, it was the understanding that the bill provided for "absolute control" by the Interstate Commerce Commission, "and it was assumed," he said, "though it was not expressed in the bill in that connection, that under the decision of the Supreme Court such a control exercised under national authority would practically oust the jurisdiction of the state commissions regarding the securities of carriers engaged in interstate commerce but organized under the laws of the respective states." Louis D. Brandeis, and George Rublee, declared Senator Newlands, appeared before the committee and urged that absolute control by the Interstate Commerce Commission would be unwise, suggesting that carriers should be required merely to furnish statements which should be given publicly, "thus relying upon publicity as a control and a corrective rather than on the absolute control by the commission."

The chairman of the interstate commerce committee went on to say that inasmuch as in the present congress politics are overshadowing economics, it has been deemed wise to create the commission in order that it might take up the security bill and other matters affecting railroad legislation.

Senator Cummins, of Iowa, who is a member of the interstate commerce committee, took exception to Mr. Newlands' statement about Brandeis and Rublee, declaring that while some of the committee may have been influenced by these gentlemen, "there were some of us who were very anxious that the bill should be pressed at all times, not only during the latter part of the long session, but during the short session as well."

Questioned specifically as to whether, as chairman of the committee in whose charge the securities bill now lies, he would use his influence to bring out this bill during the current session, Senator Newlands declared that he believed wisdom demanded that "all measures which relate to securities, which relate to the reorganization of the commission, and to other important amendments of the interstate commerce act" should be turned over to the proposed commission of investigation.

In other words, the administration has passed the order down the line to dispose of the railroad securities issue until after election by dumping it into a commission which as yet does not exist, the reason being that the legally constituted committees of congress, which have already studied the subject and reported the bill, are not able to act intelligently!

Reinforced Concrete Train Shed of Unit Construction

Construction Details of Structures of This Type Built
for the Southern Pacific Railway at Los Angeles, Cal.

Reinforced concrete train sheds of unit construction have been installed in the passenger station recently completed for the Southern Pacific at Los Angeles. The units were cast apart



The Slab Forms Ready for Concreting

from the site and were erected after curing, a method which proved so successful for the purpose that the Southern Pacific used the same type of construction in the depot at Third and



The Concreting Plant. Supporting Bents on the Left and Roof Slabs on the Right.

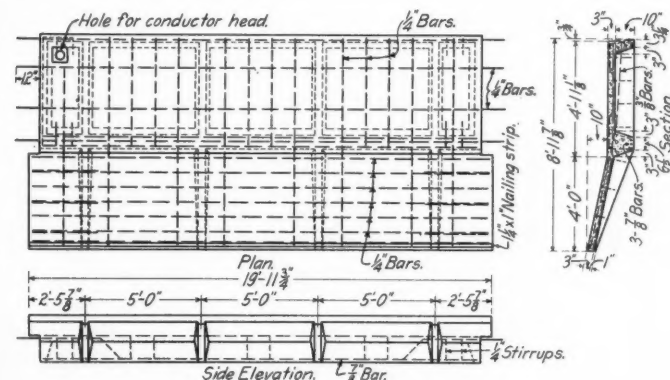
Townsend streets, San Francisco, Cal. This form of construction has also been used by the Denver Union Terminal Railway Company for the new union depot now nearing completion at Denver, Colo.

The installation at Los Angeles consists of four lines of sheds, each 740 ft. long and divided into 37 bays of 20 ft. each. As the station is of the through type, the passengers enter and leave the platforms by means of a subway under the tracks, located about midway of the length of the platforms and at right angles thereto. This subway is 33½ ft. wide, about 220 ft. long and with a floor about 15 ft. below the level of the tracks. Access from the platforms is by means of inclines from each side, which are 7 ft. wide, 65½ ft. long and rise on a 15 per cent grade.

The spread of the train shed is 18 ft. or two feet wider than the platform, and the outer edge is 16 ft. 4 in. above the top of rail. The roof is of uniform design throughout the length of all four sheds, but the columns or supports for the roof are of two types, a single column with a T-shaped head in the typical portions of the platform and a bent consisting of two columns connected by an arch for the portions of the platforms occupied by the inclines from the subway.

DESCRIPTION OF THE UNITS

The roof consists of reinforced concrete slabs stiffened by ribs and divided into units by joints at each column and along the center line of the shed. The roof is inclined toward the



Details of the Roof Slab

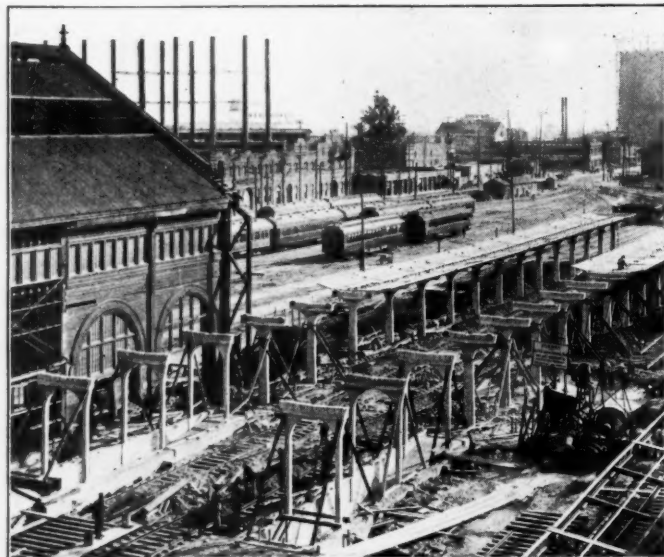
center for drainage on a slope of 1 in 4 for the first 4 ft. from the outside edge and of 1 in 24 for the remaining 5 ft. on each side of the center line corresponding to the 10-ft. width of the stem or cap of the supporting bent. In addition each slab is thicker at one end than at the other, the two thick ends of abutting slabs being set against each other to form a ridge that turns the water lengthwise of the shed to a hopper box at the point of juncture of the two thin ends of the slabs. This arrangement calls for a conductor pipe or downspout at every second bent.

The roof slab is normally 3 in. thick, except where thickened as mentioned above to provide drainage. Four transverse stiffening ribs extend the full width of the section but taper to an edge at the outside edge of the slab. There is also a transverse supporting rib placed at each end of the slab for the 5-ft. width where it is carried on the bent in addition to two longitudinal ribs.

The standard supporting bent has the shape of a "T" with a uniform thickness of 1 ft. The single column has a top width of 18 in. and a bottom width of 2 ft. and is connected to a stem 10 ft. wide by curves of 3-ft. radius. The "T" is 17 in. deep and has a projection on each side 3½ in. wide and 8 in. deep, forming a shelf for the support of the roof slabs. The "T" slopes upward from the center line at the rate of ¼-in. to

the foot to correspond with the slope of the inner portions of the slabs.

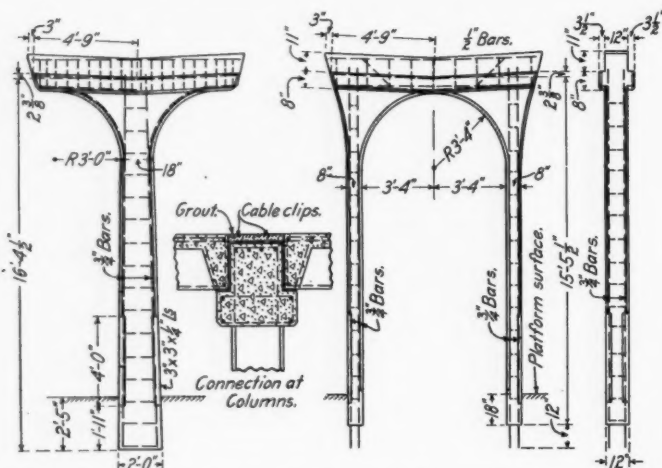
The bents over the inclines to the subway consist of two columns with a uniform width of 8 in. connected by an arch of 3-ft. 4-in. radius. The rib over the arch has the same details as the stem of the standard bent. Each corner of all concrete



Erecting the Train Shed at Los Angeles

columns is protected by a 3-in. by 3-in. by $\frac{1}{4}$ -in. angle for a distance of 4 ft. above the top of the platform.

The train shed structure was designed for a uniform live load of 32 lb. per sq. ft. over the entire surface of the roof slabs and



Details of the Supporting Bents and Construction Joints

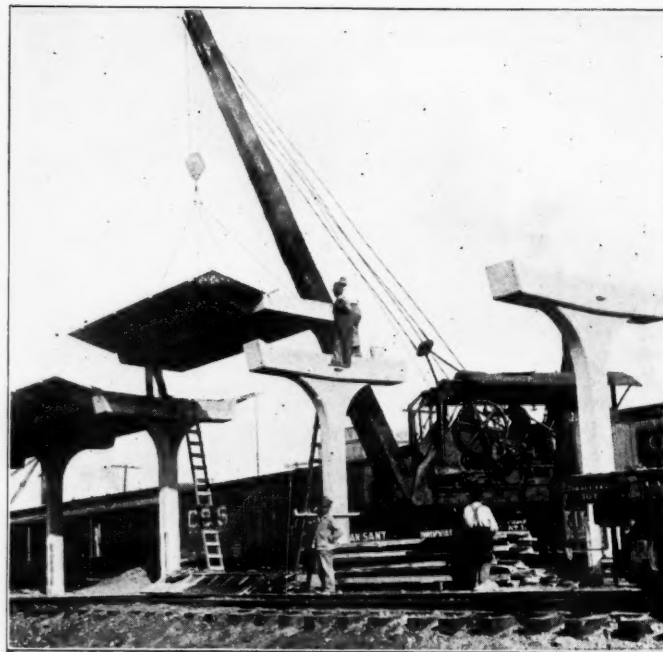
a wind load of 30 lb. per sq. ft. on the vertical projection of the structure. The maximum compressive stress in the extreme fibre of the concrete was taken at 650 lb. on the basis of a 1:2:4 concrete, and the working tensile stress in deformed steel bars of structural grade at 16,000 lb. per sq. in. Special precautions are taken in erection not to introduce any greater stresses than those existing in the completed structure.

METHODS FOR CONNECTING SECTIONS

Although the structure was built in sections, unified construction was obtained in the completed structure by the use of a number of simple but ingenious details. The post of the single column bent was designed with a plain base and was set into a socket in a previously moulded column footing, the socket being 18 in. deep and of sufficient cross section to permit the ready entrance of the column base. The crevices between the

column base and the sides of the socket were grouted after the column was in place. For the columns of the double arch bents over the inclines additional anchorage was provided by two $\frac{3}{4}$ -in. bars projecting from the bottom of each column, which were entered into specially arranged sockets. Where set over the structural steel of the subway a special structural steel base was provided for the reception and anchorage of these columns. Provision for the connection of hand rails along the edges of the inclines was made by accurately placed anchor bolts cast in the columns.

The secret of success in connecting the sections lay very largely in the accuracy with which the units were cast. Only



Lifting a Roof Slab Into Place

$\frac{1}{4}$ in. was allowed for the joint clearance, in the connection of the various parts, except where greater width was allowed for the purpose of grouting. In general, the transverse joint be-



The Train Sheds at Los Angeles

tween the ends of adjacent roof slabs was a butt joint, except in the provision for a slot to permit all of the top of the "T" or cap of the supporting bent above the level of the shelves to project up between the two slabs. As this top portion of the

bent is 11 in. deep and the slabs are 13 in. deep, the erection of the slab left a depression of 2 in. for the full width and length of the top of the bent. This depression served a definite purpose in



Inclines to the Subway, Showing Double Column Bents for the Shed

the scheme for uniting the several sections of the train shed. From each end of each slab four bars projected into this space a distance of 12 in. and which were located so accurately that

trough-shaped space was filled with cement mortar flush with the surface of the slabs and troweled to a smooth finish.

The longitudinal joint between the slabs was bevelled so that the $\frac{1}{4}$ -in. clearance at the bottom increased to $1\frac{1}{2}$ in. at the top. In addition there was a horizontal grout groove $\frac{5}{8}$ -in. deep and $1\frac{7}{8}$ -in. high in the face of the joint on each slab about midway of the thickness. This joint was also filled with cement mortar after the slabs were in place. Provision for carrying electric conduits was made by chamfering off the upper edges of the roof slabs at this joint so that when they were set as called for in the design, a groove was obtained in which a conduit could be run. In the center of each bay the electric conduit was branched down to an outlet box on the under side of the slab.

CONSTRUCTION METHODS

The units were all manufactured in a casting yard located about a half mile from the site of the station. The work was laid out with reference to convenient access to tracks in order that all operations could be carried on with the assistance of a locomotive crane, which was used for the transportation of the material, forms and concrete, for the loading and transporting of the units and for their erection at the site of the station. Special care was used also in securing good foundations for the forms. Firmly bedded wooden sills overlaid with second-hand rail carefully leveled with an instrument served as the bed for the forms. The forms were all of wood, carefully finished as to line and surface. The ribs of the slab forms were lined with sheet metal to give a smoother surface to the finished concrete and to allow the lifting of the units from the forms with less danger of wedging or binding. The forms were carefully cleaned and coated with kerosene oil just previous to each pouring of the concrete.

The concrete was mixed in a 17-cu. ft. cube mixer, the concrete being handled from the mixer to the forms in a bucket transported by the locomotive crane. The concrete was troweled to give the desired finish as soon as permissible. To facilitate this the side forms were made removable, and incidentally, only one-third as many side forms as bottom forms were necessary. The latter always remained fixed in the original position and were released about every seven days, when the slabs had cured sufficiently to permit them to be lifted.

The sheds were erected before the platforms were concreted, but at least one track was laid beside the location of each platform to permit the operation of the locomotive crane and the flat cars loaded with the units. The typical bent sections weighed 7,387 lb. and the roof sections 11,000 lb. After the roof slabs were in place and all the joints had been grouted, the roof was covered with a 3-ply prepared ready roofing.

OTHER INSTALLATIONS

The train sheds installed in the Southern Pacific station at Third and Townsend streets, San Francisco, and by the Denver Union Terminal Railway Company in the new union depot at



Santa Fe Roundhouse at Redondo Junction, Cal.

the corresponding bars from the adjoining slabs lapped by in close proximity. Two of these were $\frac{1}{4}$ -in. bars. The other two were $\frac{7}{8}$ -in. bars, and these were held together with cable clips. After the slabs were located and the clips added the

Denver differ from the Los Angeles sheds only in minor details. The installation at San Francisco was for six lines of sheds each 740 ft. long, all of standard design with single column bents. That at Denver involves 6,700 lin. ft. of shed,

considerable of it with two-column bents as required by stairways, subways, elevators, etc. An interesting feature of the design for the Denver station was a detail for the formation of expansion joints involving the use of duplicate bents separated one inch. Over the opening thus left, a sheet of galvanized iron was placed bent to keep the opening closed to the water at all times. These expansion joints are located about 360 ft. apart.

RESULTS

Unit construction along the same lines has also been used for a variety of other railroad buildings, including passenger stations and roundhouses. The San Pedro, Los Angeles & Salt Lake has built a 10-stall roundhouse of this kind at Lynndyl, Utah, and the Santa Fe has one of 25 stalls at Redondo Junction, Cal., and another of 15 stalls at Riverbank, Cal. The latter was described in the *Railway Age Gazette* on May 16, 1913. On the Salt Lake & Ogden, the Salt Lake & Utah and the Pacific Electric a number of small shelter stations, substations and small depot buildings have also been built with satisfactory results.

The idea of premoulding and subsequent erection of concrete structures has also had wide application, including the use of heavy reinforced concrete slabs for railroad concrete trestles and for concrete ballast decks of railroad deck girder spans. It has been applied in a number of cases to certain types of retaining walls, to culvert pipe and battery wells and for the concrete bents forming intermediate supports for street subways in track elevation work.

The reasons for using this type of construction for these different classes of structures are, of course, varied and in some cases, no doubt, the result of purely local conditions. However, experience with the type of train shed described above in three different localities, has demonstrated the applicability of this specialized form of unit construction and has shown several definite advantages for it. As a result of these a permanent form of construction having almost no maintenance cost is available for a reasonable price. An approximate figure of \$12 per lin. ft. is quoted as representing the cost of sheds of this type under average conditions. By removing all concrete work to a yard devoted exclusively to that purpose, factory methods may be introduced whereby the frequent repetition of identical operations gives opportunity for the development of higher efficiency. Measures may be taken for the improvement and standardization of methods or the subdivision of the work into tasks which are not possible if the sheds are built in their final location. There the work is subject to frequent interruption or changes in program because it must be carried on in conjunction with the other construction work on the station, or in some cases with the operation of the station itself simultaneous with the construction.

One of the principal economies is in form work. The complex network of staging and falsework necessary to support the green concrete at the desired elevation until it is self-supporting is entirely eliminated. It is also possible to carry out the idea of collapsible unit forms to be used repeatedly much easier with a scheme for the construction of unit sections of concrete than where the concrete must be placed in its final position. This is true particularly with complex structures like reinforced concrete train sheds having multiple surfaces. Forms lying flat on the ground in a yard are much more available for inspection, cleaning and general care of the surfaces. For the same reason, finishing can be done to better advantage and more economically. The surfaces are easier to get at, the forms may be removed more readily and the work can be timed to do the finishing when the concrete is in the best condition and with the additional advantage that it can be so arranged that a good finisher can be kept constantly at work.

The production of concrete of a minimum thickness is facilitated because of the accessibility of the forms under these conditions and of the ease with which the concrete may be protected against freezing or a too rapid drying out in hot weather.

Another advantage in this system is that it reduces to a minimum the time that the platform and the adjacent tracks are taken out of service for construction. Not only is the work actually in progress a much shorter time, but the platform is ready for use as soon as erection is completed, as there is no need of any falsework during a period of curing, as in the case of concrete poured in final position. Also traffic is not obstructed on adjacent tracks by form work which projects beyond the neat lines of the finished structure.

The reinforcement is assembled in "cages" securely wired together, which are readily placed in the forms with practically no opportunity for displacement, as these assembled reinforcement units are largely duplicates there is little opportunity for error in fabricating them and they are easily inspected and checked.

The train sheds for the Southern Pacific, both at Los Angeles and San Francisco, were designed and constructed under the direction of J. Q. Barlow, assistant chief engineer, Southern Pacific. The actual construction and detail design work was done by the Van Sant-Houghton Company, San Francisco, who control certain patents for this form of construction and who also built the other structures mentioned in this article.

NEW JERSEY COMMISSION REPORT

The Public Utility commissioners of New Jersey, R. W. E. Donges, John W. Slocum and John J. Treacy, have issued advance sheets of the annual report of the board for the year ending December 31, 1915. As an index of the activities of this commission outside the railroad field, the report sets forth that the utilities in the state, other than railroad companies, had operating revenues for the year ending December 31, 1914, aggregating \$57,624,689. The new issues of bonds and stocks approved by the commission in 1915 aggregated \$154,183,762; and of this total the amount issued by railroad companies was \$136,636,900.

The number of hearings held during the year in proceedings of a formal nature was 522, and the number of complaints dealt with informally was 364. The increases in passenger fares in southern New Jersey, which were disapproved by the board, have been made the subject of a rehearing.

Grade crossings have taken up a good deal of the time of the board. Important work is planned in Paterson, Cranford, Trenton and Orange. The board proposes to take action in regard to a number of crossings in various parts of the state which are deemed specially dangerous.

At the crossings where nothing is being done towards separation of grades, the commission has seen that additional protection or other improvements in conditions have been carried out at 707 such crossings. Flagmen have been appointed at 30; gates put in at 14, and warning bells installed at 54 crossings. Many crossings had inadequate signs or no signs at all; a standard sign has been put up at 583 such crossings. The board speaks favorably of the visual and audible automatic signal, such as is used on the Lehigh Valley, and of the electric light arrangement known as the "automatic flagman."

The board has recommended repairs on 283 railroad bridges; and the full report will contain notes of the inspection of these bridges. In the inspection department the agents of the board have covered 2,261 miles of railroad and 925 miles of electric railway track. On the electric lines there are 798 bridges. The electric companies' records of bridges are not complete and satisfactory. The recommendations of the inspectors of the board are seldom questioned by the companies.

The report contains a digest of court decisions during the year affecting the activities of the board, and ends with a series of recommendations, repeating in the main what has been recommended before, looking to the more detailed and complete regulation of the issue of securities by corporations subject to the authority of the board.

Recent Developments in Train Brake Engineering*

Recent Improvements in the Art Reviewed; Brake Shoe
Action and Effect of Brake Gear Conditions Discussed

By W. S. Dudley

Chief Engineer, Westinghouse Air Brake Company

The most notable accomplishments in the field of brake engineering during the past few years have been, not the many ingenious devices developed, but the establishment and exposition of fundamental principles resulting in a better appreciation and utilization of the possibilities of brake apparatus.

It cannot be said that recent experiments have disclosed factors of importance heretofore overlooked, for we still go back to the classic experiments of Captain Douglas Galton and Mr. George Westinghouse on the London, Brighton and South Coast in England during 1878-1879 for the most comprehensive scientific study of the fundamental features of a perfect and complete brake system. But the application of these principles to the concrete cases then in hand have become to a large extent obsolete along with the rolling stock and brake apparatus to which they referred. The several stages of development and trial in recent years have been necessary to demonstrate the degree to which these fundamental principles must be observed to get the best possible service under present day conditions.

SERIAL TRANSMISSION OF BRAKE ACTION

If the brakes on each vehicle start to apply at the same instant and with equal force, the train will commence to slow down with the least possible delay and with an entire absence of shock between cars. But as compressed air possesses inertia, and as its flow is retarded more or less by friction in the pipes, there must, of necessity, be an appreciable interval of time between the starting of the pneumatic brake actions on successive cars. With short trains of light cars this is of little consequence either in the direction of shocks produced or increase in length of stop. With trains of 10 or 16 heavy baggage, mail and Pullman cars, drawn by two heavy locomotives and having coupler and draft rigging conditions which permit of several inches practically free slack movement between cars, the effect of the serial application feature of the pneumatic brake when stopping from certain critical speeds is considerable, and judgment and skill are required to handle such trains without rough slack action and shocks.

The first provision to meet these conditions by any modification of the brake apparatus was the "quick service" feature of the triple valve which was demonstrated on the New York Central & Hudson River at West Albany in the fall of 1905. This feature (in the LN equipment) causes a slight but definite reduction in brake pipe pressure locally at each triple valve, similar to the local serial venting of brake pipe air in emergency applications, but much less in amount and under the complete control of the triple valve slide valve. Even with the quick service feature, however, there is an appreciable time element in the pneumatic service application of passenger train brakes.

After over ten years of experience with the development and successful regular service operation of electro pneumatic brake apparatus in such exacting services as that of the subway systems of New York, Philadelphia and Boston, a state of the art was reached which enabled the best design to be determined upon and the resultant performance to be predicted with certainty. The opportunity for a practical demonstration of these advances in the art came with the investigation of the entire subject of braking requirements of heavy passenger train service made by the Pennsylvania and the Westinghouse Air Brake Company in 1913. In these trials it was demonstrated conclusively that elec-

tric control of the pneumatic brake was entirely practicable; that it alone permits full advantage to be taken of all the possibilities of the available improved service and emergency functions of the pneumatic brake, and that the time element in serial transmission of brake action is nullified by its use.

RISE OF CYLINDER PRESSURE

The time elapsing from the instant the valve mechanism on a car responds to the impulses transmitted to it through the brake pipe, until the beginning of pressure development in the brake cylinder, delays the starting of effective braking correspondingly on each car. It also lengthens the period of development of full retarding force on the train as a whole.

When the triple valve of the PM equipment is made to functionate so as to apply the brakes, this means that the piston must be moved, and that the volume so displaced must be filled from absolute zero pressure to the pressure of the atmosphere and above, before effective pressure can be transmitted to the brake shoes. With the LN equipment the quick service venting of some air from the brake pipe to the cylinders, supplementing that coming from the auxiliary reservoir, tends to compensate for the piston displacement effect, but by no means eliminates it. In emergency applications, where time is of greater consequence, the quick venting of a considerable amount of brake pipe air to the brake cylinders and the use of large supplementary reservoirs for obtaining high maximum cylinder pressures and ports of ample area reduces the effect of the piston displacement to a negligible amount.

If any brakes apply on a 2 or 3-lb. drop in brake pipe pressure, due to a slight overcharge, unavoidable brake pipe pressure fluctuations caused by a sluggish feed valve, or because too light an application has been attempted by the engineer, such brakes are quite likely not to release, resulting in dragging or stuck brakes. For this reason a service stability feature has been incorporated in the valve devices of the later (PC and UC) equipment so that from 4 to 7 lb. brake pipe reduction must be made before effective braking pressure is obtained. The cylinder pressure obtained with brake equipments not having this feature for the very light reductions mentioned above are not high enough to push the shoes out against the wheels so that they obtain no effective braking power even though pressure is being admitted to the brake cylinders. Beyond his point, however, the building up of braking force is the same with or without the stability feature, consequently nothing is lost in the rate of build up of effective braking force.

The air flowing out of the auxiliary reservoir into the brake cylinder in response to a brake pipe reduction is automatically governed by the triple valve in such a way that the reduction in auxiliary reservoir pressure is made uniformly with that of the brake pipe. Consequently, the time required to obtain full cylinder pressure is substantially the same as that occupied in making a full service brake pipe reduction. This is limited by the design of the brake valve and equalizing reservoir to a minimum time of from $5\frac{1}{2}$ to $6\frac{1}{2}$ sec. from 110 lb. initial brake pipe pressure (7 sec. to 9 sec. from 70 lb.), the time becoming longer than this for all pneumatically controlled brakes as the length of the train is increased. This limiting rate has been determined upon as a result of years of experience and study of the necessary flexibility for proper service braking, all conditions being considered.

There is some stretching and readjustment taking place as

* From a paper presented before the New York Railroad Club on January 21, 1916.

pressure is built up in the brake cylinder with even the best brake rigging. On a large proportion of the cars in service today there is a very considerable further travel of the piston after the shoes are first brought to bear solidly against the wheels.

The simultaneous action of electrically controlled air brakes permits of a more rapid rate of service application than with the pneumatic brakes alone, with consequently less danger of rough handling, and reduces the skill and judgment required to produce a given result. Another important advantage secured by the electric control is the possibility of making the brakes apply uniformly on all cars in the train.

For emergency applications the maximum cylinder pressure must be obtained within the shortest possible time; because any delay at the beginning of the application, when the speed of the train is highest, has the maximum effect in increasing the distance required for stopping. With modern brake equipment 100-lb. cylinder pressure can be obtained in two seconds time. This leaves but little opportunity for materially decreasing this time within the capacity of mechanical devices to functionate reliably and of ports to transmit compressed air.

BRAKING RATIO

The maximum brake cylinder force obtainable depends upon the piston area exposed to the pressure of the compressed air, as well as upon the pressure itself. It has been necessary to go to the limit of what, at the present time, seems practicable or even possible in both these directions, as the weight of passenger equipment cars has been increased from time to time.

The capacity of the present standard sizes of brake cylinders to take care of future requirements appears to be ample in view of the fact that two 16-in. cylinders with an efficient design of foundation brake rigging, using two shoes per wheel, can furnish cylinder force adequate for cars weighing up to 240,000 lb.

The proposal to electrify the New York Central & Hudson River suburban service out of New York City first brought to a focus the necessity for a brake of greater flexibility and effectiveness than the high speed brake. In October, 1905, a trial train was equipped with an automatic brake having these desirable flexibility, uniformity and reliability features. It was recognized that by providing means for admitting air from a supplementary reservoir to the brake cylinder in emergency applications and holding the high cylinder pressure thus resulting without blow down, the stop could be correspondingly shortened, provided the wheels would not slide.

But the cars weighed only 86,000 lb., and such a proposal as this was considered somewhat rash, except by those who recalled the following paragraph in the conclusion of Capt. Galton's third paper on the Galton-Westinghouse Tests of 1879, relating to the perfect continuous brake he was recommending: "However, brought into action, it should be capable of exerting upon the blocks of each pair of wheels within two seconds a force of twice, or at the very least, one and three-quarters times the load on those wheels." While Captain Galton and Mr. Westinghouse contemplated the automatic reduction of this high cylinder pressure as the speed decreased, it was anticipated, and justly so, that such reduction would not be necessary in the case of the New York Central test train, for two reasons: The shoe pressure employed was only 140 per cent instead of 175 per cent to 200 per cent of the weight of the cars; and the work done per unit of working brake shoe surface was much greater than in the Westinghouse-Galton tests and consequently the temperature of the metals at the frictionizing surfaces of brake shoe and wheel were much higher and the co-efficient of friction correspondingly lower.

These tests showed that approximately 10 per cent shorter stops could be made by obtaining and holding, without blow down, an emergency brake cylinder pressure 30 per cent above that previously considered desirable or possible and without increased damage from wheel sliding. It has been generally accepted since these tests that high emergency braking forces, held throughout the stop, can and must be employed if modern

passenger trains are to be stopped within the distances formerly attainable with lighter cars.

The Lake Shore tests of 1909 concentrated the attention of railroad men upon the several directions in which the effectiveness of high pressures obtained in the brake cylinders may be dissipated by losses in the brake cylinder, brake rigging and brake shoes. Later developments have brought about great improvements in these directions, with the result that at the Pennsylvania-Westinghouse tests of 1913, a 12-car train weighing approximately 1,000 tons, could be stopped from 60 m.p.h. with only 125 per cent braking ratio in approximately the same distance (1,200 ft.) as was required when using 180 per cent with the cars of the 590-ton test train of the 1909 tests. It was further shown by the 1913 tests that such a train, equipped with the best obtainable design of clasp brake rigging, flanged brake shoes well worn to the wheels, and using 180 per cent braking ratio in emergency, could be stopped from 60 m.p.h. in about 800 ft.

A question naturally arising in this connection is—"What is the maximum emergency braking force that can be employed without the risk of objectionable wheel sliding?" This could be answered definitely if the rail condition remained constant, but it does not. Measurements extending over 24 consecutive hours during the Pennsylvania-Westinghouse Brake Tests of 1913 showed that the available rail adhesion varied from 15 per cent in the case of a frosty rail early in the morning, to 30 per cent for a clean dry rail at mid-day.

With 15 per cent rail friction, assuming 85 per cent brake rigging efficiency and a coefficient of brake shoe friction of 10 per cent, a nominal braking ratio of 176 per cent would cause wheel sliding, but with the same assumptions and 30 per cent rail friction, 350 per cent braking ratio could be used without causing wheel sliding. It is self-evident that wheel sliding depends more on the rail and weather conditions than on the braking ratio employed. It should be distinctly understood that the amount of braking force to be provided and the safety factor in train handling, as measured by the length of the possible stop when an emergency arises, is not limited by the capacity of the air brake devices or brake rigging. These can provide as high forces as the trucks and shoes can stand and as the unstable rail condition will permit adopting as a general standard.

For service stops 90 per cent braking ratio has been the generally accepted maximum limit for years on practically all roads in this country. It is advisable to keep this maximum comparatively low because of slack action between the cars of long trains and variations in brake effectiveness on different cars such as loaded baggage or mail cars, coaches, Pullman cars and diners in the same train. The risk of wheel sliding should also be kept at a minimum for service applications to as great a degree as will still permit service stops to be made within a reasonable time and distance. It is also advisable to insure a reserve of sufficient additional force for emergency stops.

The brake apparatus developed during the Lake Shore emergency brake tests (No. 3 control valve, PC equipment) was designed automatically to reduce the effect of variations in piston travel on cylinder pressure, especially because of the wide variations in piston travel encountered with the existing brake rigging conditions. This was accomplished by making the equalizing piston and slide valve of the control valve govern the pressure built up in accordance with the brake pipe reduction, not in the brake cylinders direct, but in an application chamber not subject to leakage and of fixed volume for all weights of cars. The pressure in this application chamber, through the medium of an application piston and slide valve then measured into the brake cylinders from the service reservoir the amount of compressed air necessary to secure and maintain the pressure previously obtained in the application chamber regardless of the piston travel or leakage, up to the ample capacity of the service reservoir.

Even with this provision, however, it is found that the bad effects unavoidable in a brake rigging using one shoe per wheel

on very heavy cars, were sufficient to demonstrate the unwisdom of applying the most advanced types of pneumatic brake apparatus without providing suitable installation conditions for it to work under.

FOUNDATION BRAKE GEAR

Experience has shown that the use of a higher total leverage ratio than 9 to 1 would so magnify the effects of shoe wear, horizontal travel of shoe, and lost motion and deflection in the brake rigging, that the piston travel could not be maintained at the desirable 8 in. for full service applications without destroying the shoe clearance necessary to avoid the many evils of dragging brake shoes and "stuck" brakes when the brakes were supposed to be released. In the Lake Shore tests, with the brake rigging adjusted to 6-in. instead of 7-in. piston travel with a standing emergency application, an increase of 35 per cent in tractive effort was found to be required to haul the train at 60 miles per hour, this being the average observed over one mile of track.

The design of the modern six-wheel truck is such that the single brake shoe must be hung low on the wheel. The forces on the single brake shoes are consequently in such directions as to develop a considerable downward pull on the brake beam hangers. The forces thus developed, especially on six-wheel truck cars, are sufficient to compress the equalizer springs practically solid. It is evident that if the total leverage ratio could be reduced, the evil effects of this action could be correspondingly lessened. For the type of six-wheel truck with one shoe per wheel used in the Lake Shore tests, it appeared that a total leverage ratio exceeding 6 to 1 would involve material losses in efficiency as a result of the excessive increase of running over standing piston travel adjustment when slack adjusters were not used, or of running emergency over running service piston travel when automatic slack adjusters were used. After a study of the reasons for the losses experienced had developed the principles to be observed in an efficient foundation brake rigging, it was plain that the crux of the problem lay in the location of the shoes and the disposition of the forces applied to them. When existing evils in these directions were eliminated, a total leverage ratio of 9 to 1, or even higher, was shown to be feasible.

During the Pennsylvania-Westinghouse brake tests of 1913, an ingenious arrangement was devised to measure the pressure delivered to the brake shoes by means of the impressions made by a hardened steel ball in a soft steel plate of known hardness, inserted in the brake rigging as near the brake shoe as possible. While the values observed when the car was running were vitiated by the disturbing effects of the unavoidable vibrations, rolling and impact action of the ball on the plate and so on, the data secured in the standing tests was much more consistent than any before obtained. There is still lacking, however, a means for determining accurately the normal brake shoe force actually delivered to the wheel. The data secured during the 1913 tests, though unsatisfactory in many respects, indicated that in an emergency application (125 per cent to 150 per cent braking ratio) the particular rigging installation tested, actually delivered to the wheel approximately 85 per cent of the pressure calculated from the observed brake cylinder pressure and total leverage ratio. A poorly designed rigging has doubtless a much lower efficiency than this. A well designed and installed rigging may be materially higher.

An efficient foundation brake rigging is therefore one of the vital factors in a perfect brake. It can, by neglect, become one of the chief sources of improper brake action, loss and danger. If given proper consideration in the design installation and maintenance, it can be made, not only highly efficient in the performance of its specific function, but also contributory to greatly improved brake shoe, wheel, journal and pedestal conditions.

EFFICIENCY OF BRAKE SHOES

The sum of all the losses in the brake cylinder and foundation gear is but a fraction of what results from the use of such a device as a brake shoe to produce the desired retarding force.

For every 100 lb. pressure on the brake shoe, not more than 10 or 12 lb. tangential pull on the wheel is obtained when stopping a modern train from 60 m.p.h. Ordinarily 8 lb. or 10 lb. would be a fair average. A statement that the mean coefficient of brake shoe friction is 10 per cent conveys but little impression of what the real state of affairs is. But if we say that the brake shoe performs its function at the expense of 90 per cent of the force delivered to it; or, in other words, has an efficiency of only 10 per cent we see the true relation of the forces acting much more clearly. On account of this factor being so low, changes, small in themselves, may amount to a considerable percentage of the whole, and as the length of stop varies inversely with the percentage variation in the average coefficient of friction of the brake shoes, apparently slight and often unsuspected changes in brake shoe friction can account for considerable differences in stops expected to be alike.

During the Pennsylvania-Westinghouse brake tests, studies of the detail performance of brake shoes under both laboratory and road service conditions developed much new and important data pertaining to present-day service requirements. The relation between road and laboratory test results on brake shoes were placed on a more comparative basis than had previously been possible. The following is a brief summary of the conclusions from these tests.

The performance of cast iron brake shoes varies between wide limits. The ordinarily assigned causes for this variation (such as speed and time of action) become effective chiefly as they affect the temperature of the working metal of the brake shoe and wheel.

The brake shoe bearing area and consequently the generation of heat in the working metal and the resultant coefficient of friction varies considerably during the progress of a single stop and to a greater degree as the fit of the shoe to the wheel may change, due to warping or continued rubbing. Due to this effect alone the emergency stopping distance from 60 m.p.h. may change by as much as 20 per cent.

The use of two shoes per wheel instead of one will result in a higher coefficient of friction and less wear per unit of work done, the durability under clasp brake conditions being about 40 per cent greater than under single shoe conditions.

Flanged shoes provide more available area than unflanged shoes and, when worn in, may shorten the stops about 12 per cent.

The use of two shoes per wheel permits a design of rigging which makes possible the use of flanged shoes without danger of pinching flanges, thus eliminating excessive flange wear or non-uniform brake forces which result when flanged shoes are used with rigid beam connections.

The wear of flanged shoes is about 20 per cent less than unflanged shoes.

The Galton-Westinghouse tests were the first to establish the character of the variations in brake shoe resistance during the stopping of a train. With constant brake cylinder pressure a fairly uniform retardation exists for a considerable portion of the time during which a train is being stopped from a high speed. But as the stopping point is approached and the speed becomes say 25 to 30 m.p.h., this uniform deceleration is replaced by a continually increasing retardation until a very high retardation is reached just as the train comes to a standstill. We now know that the fairly constant retardation during the middle portion of the stop, notwithstanding the continual decrease in speed, is due chiefly to the fact that the limit of the heat carrying capacity of the metal brake shoe is reached very shortly after the brakes become fully effective. For some time thereafter the work being done and corresponding temperature being imparted to the metal particles in working or abrasive contact is so great per unit of time, that the shoe cannot conduct the heat away fast enough to prevent the contact particles becoming red or white hot, or even gasified, producing a substantially uniform, "molten metal" condition of the rubbing surfaces, the friction being still further reduced by the roller action of the particles torn off and

being carried along by the surface of the wheel. This continues as the speed is reduced, until a point is reached where the generation of heat is no longer beyond the conductive capacity of the shoe metal.

The temperature of the rubbing surfaces then becomes lower, the abraided metal particles being ground off at a relatively low temperature, and therefore at a relatively higher tensile and crushing strength. Hence the rapid rise in retardation begins at the point in the stop where the brake shoe ceases to throw off sparks and begins to discharge non-incandescent particles of metal.

It is evident that the greater the work demanded per unit of brake shoe working surface, the more the frictionizing capacity is reduced by the excessive heating of the abraiding particles. In grade service, where the shoes and wheels both become very hot, there is the greatest need for every possible relief from such excessive demands.

IMPROVEMENTS EFFECTING SAFETY AND FLEXIBILITY OF CONTROL

Even after a moderate or heavy brake pipe reduction, considerable trouble is experienced in releasing the brakes on the rear of a long train of heavy cars, promptly and certainly, especially with low main reservoir pressure and small compressor capacity. While increased capacity in these directions improves this condition to a very large extent, it is evident that the valve device can be made quite sensitive to release (*i. e.*, to an increase in brake pipe pressure) to the further benefit of the brake as a whole. This can be done without danger of unintended release because the unintended changes in brake pipe pressure are always in the direction of producing a reduction rather than an increase in brake pipe pressure. Recent apparatus has therefore been designed with this end particularly in view, which not only improves the release of the brakes having this feature, but also tends to improve the releasing action of all brakes in the same train of mixed old and new equipment.

Modern train service requires more than ever before, that the brake shall be capable of repeated re-applications to full pressure, without appreciable loss in effectiveness and still be able to respond with maximum pressure in emergency. The quick recharge feature, which originated with the development of the graduated release feature for electric traction brake equipment, supplies the function necessary to meet this requirement.

The means for providing the quick recharge feature also serve, automatically, to enable the release to be made in a series of

brake equipments can be adjusted in a simple and positive manner to provide a quick recharge at all times, with or without the graduated release feature, as may be desired.

Considering the ordinary full service stop from 60 m.p.h. as 100 per cent, the attempt to make an emergency application following a partial or full service application with the high speed (PM) brake equipment does not produce any increased brake cylinder pressure or shorter stop than if only a full service application were made. With the improved equipment now available (UC equipment) operating pneumatically, an emergency application following a partial service application will shorten the stop approximately 14 per cent and following a full service application about 10 per cent. With electro-pneumatic operation these figures are respectively 23 per cent and 15 per cent.

ACCIDENT BULLETIN NO. 56

The Interstate Commerce Commission has issued accident bulletin No. 56 containing the record of railway accidents in the United States during the quarter ending June 30, 1915; and also the record for the 12 months ending on that day. In the quarterly statement the number of passengers killed in train accidents is given as two, as compared with six in the last preceding quarter, and five in the quarter ending June 30, 1914.

The annual records, showing large decreases as compared with preceding years, were discussed in an editorial in the *Railway Age Gazette* of January 21. We copy here the principal statistical tables, using instead of the short table, No. 1, which has usually been reprinted with the quarterly report, the larger table, No. 1B, in which casualties to persons are shown more in detail. Table No. 1B does not include industrial accidents; adding these to the totals of the table, the grand total number of persons killed during the year was 8,621, and of injured 162,040, as shown in the following table:

CASUALTIES, YEAR ENDING JUNE 30, 1915

	Killed	Injured	Killed	Injured
Total of Table 1B.....	.....	.....	8,278	62,848
Industrial accidents to employees—				
Working on tracks or bridges.....	146	24,867	.....	.....
At stations, freight houses, etc.....	69	23,533	.....	.....
In and around shops.....	63	45,029	.....	.....
On boats and wharves.....	26	1,731	.....	.....
At other places.....	39	4,032	343	99,192
Total.....			8,621	162,040

TABLE No. 2.—COLLISIONS AND DERAILMENTS, YEARS ENDING JUNE 30

Classes.	1915			1914			1913		
	Number.	Number of persons—		Number.	Number of persons—		Number.	Number of persons—	
		Killed.	Injured.		Killed.	Injured.		Killed.	Injured.
Collisions:									
Rear.....	435	26	833	\$502,578	815	80	1,671	\$988,388	1,143
Butting.....	282	65	1,265	439,794	484	100	1,966	817,518	682
Trains separating.....	303	3	77	131,541	397	8	94	175,499	474
Miscellaneous.....	2,518	40	1,318	1,078,853	3,545	99	2,145	1,793,874	4,178
Total.....	3,538	134	3,493	2,152,766	5,241	287	5,876	3,775,279	6,477
Derailments due to—									
Defects of roadway.....	1,507	43	1,540	1,120,583	1,888	66	1,987	1,516,343	1,959
Defects of equipment.....	3,416	54	766	2,648,133	4,186	50	1,074	3,358,088	4,366
Negligence of trainmen, signalmen, etc.....	297	20	304	176,453	426	19	461	314,065	515
Unforeseen obstruction of track, etc.....	244	60	484	320,190	318	52	439	410,268	369
Malignant obstruction of track, etc.....	70	12	137	202,682	58	14	155	87,985	62
Miscellaneous causes.....	1,315	59	830	1,180,091	1,689	117	1,445	1,503,153	1,778
Total.....	6,849	248	4,061	5,648,132	8,565	318	5,561	7,189,902	9,049
Total collisions and derailments.....	10,387	382	7,554	7,800,898	13,806	605	11,437	10,965,181	15,526

steps, or graduations, if desired. For steam road through service this feature is not of great importance. The quick recharge feature is always desirable, however, and therefore means have been devised so that all of the recent improved type of

Annual table No. 2, showing the number of collisions and derailments, classified according to causes, etc., is given herewith.

Comparisons with 1914 and 1915 are found in table No. 1C following:

TABLE No. 1B—CASUALTIES TO PASSENGERS, EMPLOYEES, AND OTHER PERSONS. YEAR ENDED JUNE 30, 1915.

Causes	Passengers		Persons carried under freight trains		Total		Trainmen in yards		Trainmen crossing bridge-tenders, etc.		Other employees		Total employees on duty		Employees not on duty		Other persons not trespassing		Total persons	
	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured	Killed	Injured
Collisions	39	1,689	84	2	214	41	1,987	35	584	9	293	16	322	16	322	16	322	16	322	16
Derailments	41	2,113	1	132	3	284	45	2,529	94	888	7	122	13	163	1	1	63	9	105	111
Misc. train accidents	3	116	2	3	14	3	132	3	155	2	25	1	24	1	3	62	9	11	11	127
Bursting of boilers, etc.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	83	3,918	1	218	5	512	89	4,648	143	1,896	18	531	30	578	1	3	10	128	235	221
Other Than Train Accidents																				
Accidents to roadway	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coupling or uncoupling cars	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
While doing other work about trains	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Coming in contact with overhead	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Collisions on bridges	3	10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Falling from cars or engines	18	162	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Getting on or off	57	2,293	1	67	4	62	62	2,422	16	2,115	12	1,289	25	2,521	2	54	8	121	18	266
Other accidents on or around trains	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Being struck or run over at stations	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Being struck or run over at highway crossings	32	91	1	2	1	7	34	100	27	42	45	123	64	222	27	82	104	195	144	305
Being struck or run over at other places	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Other causes	3	831	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total, last 11 items	113	6,361	2	417	18	684	133	7,462	266	13,548	158	6,631	269	11,117	61	394	349	1,158	270	1,841
Grand total	196	10,279	3	635	23	1,196	222	12,110	409	15,444	176	7,162	299	11,695	62	397	359	1,286	289	2,076

ANNUAL TABLE No. 1C.—Casualties to persons—Years ended June 30.

Item.	1915		1914		1913	
	Killed	Injured	Killed	Injured	Killed	Injured
Passengers:						
In train accidents...	89	4,648	85	7,001	181	8,662
Other causes	133	7,462	180	8,120	222	7,877
Total	222	12,110	265	15,121	403	16,539
Employees on duty						
In train accidents...	221	3,371	452	4,823	557	6,905
In coupling accidents	90	1,993	171	2,692	195	3,360
Overh'd obstruc., etc.	45	1,083	89	1,490	94	1,835
Falling from cars, etc.	368	10,748	497	14,563	560	16,005
Other causes	870	20,865	1,314	27,273	1,533	28,514
Total employees...	1,594	38,060	2,523	50,841	2,939	56,619
Total pass. and emp.	1,816	50,170	2,788	65,962	3,342	73,158
Employees not on duty						
215	840	327	1,097	362	1,178	
Other persons not trespassing:						
In train accidents...	7	110	9	148	9	110
Other causes	1,156	5,280	1,298	5,827	1,279	5,932
Total	1,163	5,390	1,307	5,975	1,288	6,042
Trespassers:						
In train accidents...	88	161	75	178	90	174
Other causes	4,996	6,287	5,396	6,176	5,468	6,136
Total	5,084	6,448	5,471	6,354	5,558	6,310
Total Table 1B....	8,278	62,848	9,893	79,388	10,550	86,688
Industrial accidents.....	343	99,192	409	113,274	414	113,620
Grand total	8,621	162,040	10,302	192,662	10,964	200,308

The bulletin gives the usual tables classifying personal casualties in great detail, including two tables in which passenger trainmen are separated from freight trainmen.

This bulletin contains reports, filling 31 pages, of investigations of accidents made by the agents of the commission since the last preceding quarterly bulletin. These accidents were as follows:

Chic., Mil. & St. P.	Oakwood, Wis.	Jan. 30	Derailment
Chic., Mil. & St. P.	Oakwood, Wis.	Feb. 9	Derailment
Chic. & St. Western	Talmage, Iowa	Feb. 22	Derailment
A., T. & S. Fe	Monrovia, Cal.	Apr. 4	Butting collision
Great Northern	Rainbow, Mont.	Apr. 8	Rear collision
Lake Shore Electric	Fremont, Ohio	Apr. 29	Butting collision
Pacific Electric & A. T. & S. Fe	Los Angeles, Cal.	May 7	Side collision
San P., Los A. & Salt Lake	Los Angeles, Cal.	May 17	Butting collision
Chic. & Alton	Minier, Ill.	June 3	Derailment
Seaboard Air Line	Alton, Ala.	June 9	Derailment
Southern Pacific	Tonopah, J'n, Nev.	June 15	Derailment
Western Maryland	Thurmont, Md.	June 24	Butting collision
Chic., Rock I. & Pacific	Platte River, Mo.	June 27	Butting collision
Mobile & Ohio	Lawly, Ala.	June 29	Butting collision

Electric Railways reporting to the commission (not included in the foregoing statistics) had 372 persons killed during the year and 5,147 injured; and there were 136 collisions and 73 derailments. Train accidents are charged with 19 fatalities. The total number of passengers killed from all causes was 35, and of employees 43 (16 in industrial accidents). The number of trespassers struck or run over by cars was 93 killed and 77 injured.

A NEW DUPLICATING ATTACHMENT

The Mimeoscope is a new device recently put on the market by A. B. Dick Company, Chicago, as a supplement to the Edison-Dick Mimeograph in the production of duplicates by means of the Dermatype stencil. Dermatype is a thin tissue made impervious to ink by a new process in which impressions may be made by the keys of a typewriter, stylus, or by type or cuts placed in a special press, called the Formograph. Thus, a stencil is formed without actually cutting the tissue and it is because of this property that the Mimeoscope is possible. By means of this, drawings may be reproduced on the Dermatype tissue in a manner closely approximating ordinary drafting.

This apparatus is essentially an illuminated drawing board. A ground glass forms the top of a pyramidal box having metal sides, which contains an electric lamp, the whole being supported on a suitable stand. Tracings may be made from any sketches, drawings, blue-prints, etc., on any material which is sufficiently translucent, or which may be made so by the use of

a light oil. They may also be made from pencil sketches drawn directly on the ground glass.

The process consists in covering the ground glass and any sketch or drawing to be traced by a sheet of flexible, transparent material resembling celluloid. This is moistened by a special preparation, after which a sheet of the Dermatype is stretched or rolled tightly over it, and clamped into place. When the Dermatype has become thoroughly moistened from contact with the flexible writing plate, it is ready for tracing, which is done by means of styli, of which a number are provided, the wheeled types proving useful for long lines, particularly in tabular work. For mechanical drawings, a T-square, compasses and curved rule are used, but freehand drawings and sketches may be made with equal facility. The lettering may be done freehand, or the sheet of Dermatype may be removed from the Mimeoscope and the lettering put on with a typewriter. Corrections are made by means of mimeograph varnish, which renews the coating in the Dermatype.

The Mimeoscope in combination with the Formograph and the typewriter offers opportunity for a wide variety of uses for the mimeograph process. Ruled forms are readily made with the help of a universal scale sheet, by means of which lines are readily spaced any desired distance apart, but preferably equal to the spacing of the lines on a typewriter, to permit ready interlining of headings, notes, etc. As typical examples of the use of this process as applied to railroad work may be mentioned tariff sheets, report blanks, small standard drawings and in-



The Edison-Dick Mimeoscope

struction sheets. A particular advantage in connection with the latter lies in the ability to interspace sketches or drawings on typewritten sheets. Cross section sheets for the plotting of curves are easily made, which have an advantage over a printed sheet in that the graduations may be made to suit any scale desired.

The greatest advantage of the mimeograph process of duplicating lies in its economy compared with blue printing or press printing, and many railroads are taking advantage of it, in several instances by the organization of special duplicating bureaus, whereby a small force does this work for all departments. Because of this specialization those employed develop skill in the use of the machine, insuring more perfect workmanship and larger output, and the full time use of the machine.

OPEN LETTER TO THE RAILROAD COMMISSIONS OF TEXAS

By Dr. J. M. Head

Houston, Texas

The recent trial of the railroads of this state for the offense of wanting an increase in freight rates sufficient to permit them to live and prosper has been concluded after the very exhaustive taking of evidence pro and con; and the very verbose arguments of the prosecuting attorneys and those for the defense have all been made and put in the record.

I find one very important factor left out and not heard from, and that is the man who actually pays the freight. In the taking of evidence in this case, the commercial bodies from every large city in the state had so-called experts to represent them, and were perfectly willing for the roads to have an increase in rates, so long as it did not interfere with the business of their members or reduce their natural and unnatural territory by so doing. I say unnatural territory for the reason that every city in the country is trying to extend its trade territory and maintain competition at the expense of the roads. Every manufacturer, jobber and shipper of any consequence in the state had representatives to protest against an increase of rates on the stuff he made or handled, but was quite willing for you to grant the increase on everything else. By the time they were all heard and all protests were in there wasn't anything left except the products direct from the farm to grant an increase on, and I am glad to note that the Farmers' Union representatives had the good sense to petition you for the increase.

Now, as a matter of fact, neither the farmer, stockman, wool grower, manufacturer, wholesaler, jobber, distributor nor retailer pays the freight; it is the ultimate consumer who pays every cent of cost there is in anything he uses. When I bought the suit of clothes I am wearing I paid the cost of production—including the wool grower, the cotton planter, the broker, the manufacturer, the jobber or wholesaler, the retail merchant who sold it to me, and *the freight*; and when we build a house we pay for every expense attached to it, and the freight on all the material used; and not the saw-mill man, the iron manufacturer or the local retailer who sold the material. We have to charge to the renter a sufficient rent to earn the proper interest on the investment, and it seems to me that I am the man to "kick" on increased freight rates, if they are so burdensome.

I figured out about what my freight bill was each year on everything my family and myself use, and it amounted to about eleven dollars a year, and to grant the railroads an increase of 10 per cent on present rates would not cost me over 50 cents a year, or the price of four good cigars or four bottles of beer, which the average man would buy for his friends and never think of. Nor would the solicitous politician who is trying to shield the dear public from the extortions of railroads and big corporations or alleged trusts. I take the position that I can far better afford to pay this increase of 10 per cent or 15 per cent, with the attendant prosperity it would bring to the country, and the very great increase in my business and income, than I can pay the present rates under present conditions.

It is my belief that if the railroads were in a prosperous condition we would have more business than ever before in the history of the country, and it also occurs to me that as the above mentioned protestors would do so much more business, with the same overhead charges, they should welcome an increase in freight rates.

The prosecuting attorneys and solicitous politicians say it will cost the dear public \$5,000,000 a year to grant this raise; they haven't figured the other side of the case, where it will cost the same dear people \$5,000,000 not to do it. A man can afford to pay an enormous rent for a place of business on a prominent street, in a prosperous city where there is business enough to justify it, but he could not afford to pay any price for the same place, if the earning capacity of the people of the city were so reduced that they had nothing to buy his goods with. It is a very mis-

taken idea to try and save 50 cents freight on something and lose a good chance to make a dollar to pay it with. We can very much better afford to pay that extra amount and earn the dollar; and I believe if an increase were granted it would remove the last chain that is holding back the greatest era of prosperity this country ever saw.

I am perfectly willing for the railroads to earn as much money on their investment as the banks of the country are doing. Why permit the banks to make from 20 to 40 per cent a year on their capital invested and restrict the railroads to 6 or 8 per cent—and then not let them earn that? The patrons of the banks are paying those earnings, just the same as the patrons of the railroads are.

The public pays the earnings on all capital, whether invested in banks or trust companies, industrial corporations or mining; so why restrict the roads to starvation returns? They are certainly of far greater value to the country than the banks; they have more money invested, employ more people, and are the largest purchasers of materials of any business in the world. They are more necessary to the very life of business than any other thing or agency, for they occupy the same relation to business and commerce as our arteries and veins do to our bodies—they carry the life-sustaining forces from one part to the other; and who would think of trying to cut off the circulation from any part of his body or impair its circulation in any way? If anything got the matter with it, we would go to the best doctor we could find to have it remedied at any cost.

Just so much as you restrict the proper operation of the railroads, just so much you interfere with the prosperity of the people. Give the people something to do, to earn something, and they won't object to paying a little more freight. If they haven't any business or work to do, they cannot afford to pay any amount.

It is bad business to get capital from anywhere to invest in stocks or bonds that are represented to be safe and profitable, and rob the investors by not permitting them, through adverse legislation and regulation, to earn enough money to keep the property invested in out of the hands of a receiver.

I would rather point with pride to Texas railroads being prosperous and earning as large dividends as our banks than to say we robbed a lot of unsuspecting Dutch investors by not allowing the road they invested in to earn enough money to pay interest and operating expenses. I would rather point with pride to the fact that Texas railroads were so prosperous and such good dividend payers that 50 per cent of the stock and bonds were owned by Texas people than to gloat over the fact that they were all owned by outside capital, and that it was all right to forage on them whenever we so desired, and prevent them from earning a just amount on the capital invested.

It is bad politics to be forever trying to make political capital by baiting and exploiting the railroads. I have traveled over this state a good deal in the last 15 years, and most of the hue-and-cry against the railroads and increases in rates have been by the solicitous politician, who is so zealously looking after the interests of the "dear peepul" that he has about starved the goose that lays the golden eggs.

I believe I voice the sentiment of the great majority of the people of the country, who have to pay the freight, and the hospital bills for all the sick railroads which have been forced into the financial hospitals through a penny-wise and pound-foolish policy. I want to go on record that I stand ready and willing to pay my part, and, if I am permitted to pay it, I am certain I will have more to pay it with than I have now to pay the present rates.

I hope many readers of this letter will let you know how they feel on the subject by an expression through the press, as I believe in the fullest publicity in this case. We have been allowing the politicians to think and act for us too long in these matters, and if the responsible business element of the country would come out and express themselves through the press, we would have less to complain of and better business.

HAND SIGNALS FOR CROSSING WATCHMEN

The standard disk used by the attendants at highway grade crossings on the Central of New Jersey, referred to in an editorial in the *Railway Age Gazette* of January 14 is 15 in. in diameter, and is made of sheet iron, No. 20; its outline is shown in Fig. 1. The handle and brackets are of No. 16 iron and the bracket on which the lantern is hung is of $\frac{1}{8}$ in. iron, one inch wide. The upper and lower parts of the lamp bracket slide

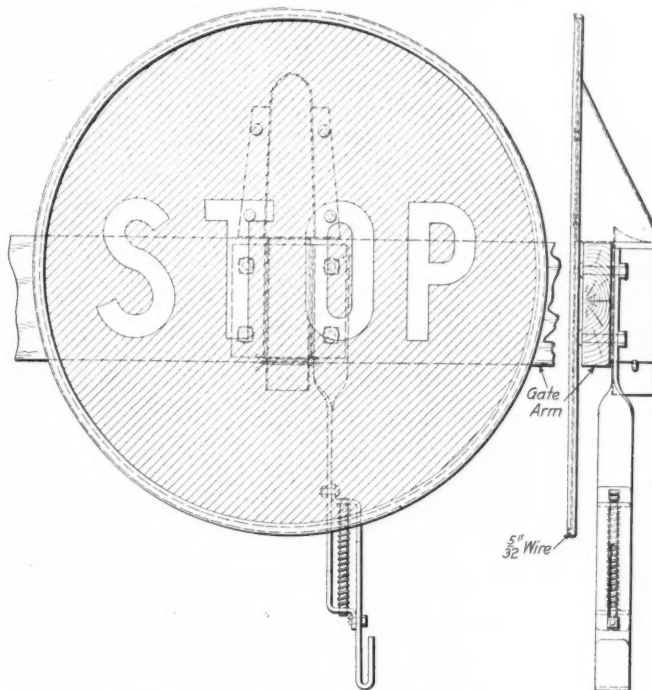


Fig 1—Highway Crossing Stop Signals; Central Railroad of New Jersey

within each other, as shown by the outline of the slot; and the spring makes an elastic support for the lamp. The circumference of the disk is stiffened by a wire 5-32 in. in diameter.

As shown in the drawing, the disk is attached to a crossing



Fig. 2.—Hand Signal Used at Crossing on the Long Island Railroad

gate. This arrangement is followed at all crossings where gates are in use. The lettering is white on a ground of bright red.

The halftone illustration, Fig. 2, shows a similar disk as used on the Long Island road. This picture was taken at the Jericho turnpike crossing, Mineola, N. Y. The disk is, of course, lettered the same on both sides. This disk is 18 in. in diameter,

with letters 8 in. high. The letters on the Central of New Jersey disk (Fig. 1) are 4 in. high. The Central has a few 18-in. disks with letters 6 in. high.

The design of disk shown in Fig. 3 is one of which 100 are being used on the New York Central at certain crossings where there are no gates. This disk is painted white, with lettering of red. At the same time the New York Central is trying a

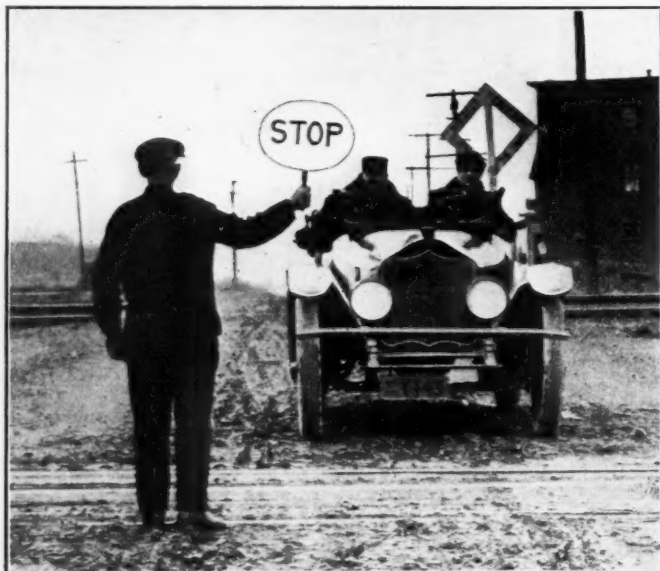


Fig. 3.—Crossing Signal Used on the New York Central

new double-faced lantern, the design of which is shown in Fig. 4. The glass which bears the letters is red, and is about 12 in. in diameter.

Fig. 5 shows still another design of disk; it is like that of the New York Central except that it is round instead of oval, and the letters are black instead of red.

This is used at crossings in suburban towns near Chicago, on



Fig. 4.—Lantern for Highway Crossing Watchmen

the Milwaukee division of the Chicago & North Western, and is to be put in use at other places on that road. The men at these crossings will wear a policeman's uniform and will be empowered to make arrests when necessary. Where gates are used, the gate arms are being painted with bright stripes in place of the regulation white, in order that they may be more readily seen.

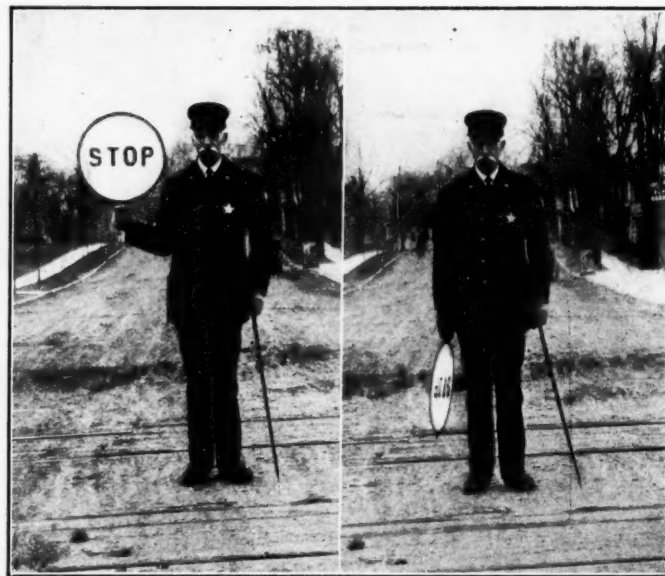
The road proposes to adopt the practice here outlined, at all suburban towns near Chicago where the town officers will em-

power the crossing watchman to act as policeman. Near many crossings large signs bearing the words "DANGER: STOP, LOOK AND LISTEN" have been set at the side of the highway from 300 ft. to 500 ft. back from the crossing. At many places banks of earth that obstructed the view have been cut down in order to insure a clear view of trains to persons approaching the crossing.

The Northwestern has issued a new set of rules for crossing watchmen which include the following:*

"Watchmen must at all times be where they can be seen when persons or vehicles are approaching the tracks, and when no train is approaching will hold the disk in a manner that will not attract attention.

"When a train is approaching the watchman must locate himself so as to be plainly seen. He will display the white disk by day and the white lantern by night and in addition will blow his whistle whenever necessary to warn the public of the approach of trains. Where there are two or more tracks the watchman must take a position near the opposite track from the one on which the train is approaching, where he can best



Train Approaching No Train Coming
Fig. 5—C. & N. W. Crossing Signal

protect the public from a train approaching from the opposite direction. The watchman will protect the crossing in the same manner where gates are provided, but are temporarily out of service.

"Where two or more watchmen are provided at a crossing having gates, one will operate the gates and the other protect the crossing in accordance with the foregoing rules.

"When drivers do not obey signals to stop, watchman must give the number of automobile, name of driver or other identity of the vehicle, together with time and date, and as much other information as possible, on report blanks furnished for that purpose.

"Crossings must not be left unguarded during the hours prescribed for the crossing to be protected."

RAILWAY CONSTRUCTION IN BOLIVIA.—The railway line under construction from Oruro to Cochabamba—both very important mining centres—is now open to traffic as far as the station of Retiro, near to the town of Capinota. The position reached marks about one-third of the total distance to the terminus at Cochabamba. From Retiro to railhead of the tramway to Cochabamba is a distance of about 20 miles, over a good road and easy of access. The new extension of the railway will save travelers the difficult, and sometimes dangerous, passage over the River Arque.

* Extracts from the rules of the Central of New Jersey were given in the editorial above referred to. (Page 46, January 14.)

THE COMMISSION ON VALUATION FOR RATE-MAKING PURPOSE *

By Charles C. James

Recently the interstate commerce commission handed down a decision in the case of *Lum v. G. N. Ry.* (33 I. C. C. 541) to which only passing notice was given in the press. The conclusions reached, which were of no general interest, were published in a brief way, but the premises on which the conclusions were based escaped attention entirely. These premises were fundamental and their acceptance is likely to have far-reaching results, not alone in the railway world, but wherever the valuation of public utilities enters into the fixing of rates for public service. The commission's opinion was written by Commissioner Balthasar H. Meyer, formerly of La Follette's famous Wisconsin state railroad commission, and one of the earliest students in public life of the problems with which this opinion deals. His unquestionable authority to speak on the subject is not unlikely to result in this opinion being accepted as establishing the precedent by which all similar questions in the future shall be decided by the federal commission and by which the decisions of all other commissions and of the state and federal courts most probably will be greatly influenced. That this may be looked forward to with complaisance cannot be admitted when from examination of the reasoning set forth in the opinion we observe how exclusively it rests upon the unacceptable assumption that the only property on which the carriers are entitled to earn a return is that part of their road and equipment acquired by capital investment (as distinguished from the investment of profits from operation), and not on all of that unless its depreciation has been made good by the reinvestment in road or equipment of depreciation funds specifically labeled as such on the carriers' books.

In discussing the subject of deducting depreciation from the cost of replacement new as of the date of inventory, to determine the value of the property devoted to the public service, the opinion reads

No hard and fast rule has yet been established for determining for all roads the fair value of the property. There may be instances where no depreciation should be deducted from the cost of the property, but in the three cases before us there is no doubt that the depreciation actually accrued must be deducted. In the five years ending in 1912, for example, the Allouez Bay Dock Company charged \$978,396.34 to operating expenses on account of dock depreciation. The commission is asked to take into consideration the resulting operating expense so increased in fixing an ore rate and at the same time allow a return on the cost new of these docks. This cannot be conceded. Similarly with the depreciation accrued on equipment.

In the case of the Iron Range, the accrued depreciation on docks, and equipment that had been actually charged to operating expenses, as of June 30, 1914, was \$3,787,440.09. The corresponding amount for the Missabe was \$4,247,020.81. It was suggested that these depreciation funds represent cash used in the business, and the interest on the funds is entered in the income amount. In none of the cost estimates submitted in this case was any deduction made on account of such interest received. It may be noted in this connection that a consideration of the miscellaneous income from sources other than operating revenues, in comparison with the miscellaneous rents and other deductions from income in the case of the Iron Range and Missabe roads, indicates that the plan pursued in the cost exhibits of confining attention to operating expense, taxes and capital charges, and ignoring other income items, does no injustice to carrier.

It would seem from the commission's statement of the case that if the carriers had made a showing of the income from working capital and collateral investments not included in their road end equipment accounts, such assets would have been accepted as a part of the property devoted to their common carrier service on which they might have claimed an adequate return through their transportation rates. The commission itself suggested a seven per cent return on the property of these carriers, and apparently rendered its decision with that rate of return in mind. If the income actually derived by these carriers from such ancillary sources amounted to less than seven per cent, manifestly a mistake was made in not showing such return and claiming the right to make up out of railway revenues the amount of the shortage.

It does not seem too much to say that even though this showing was not made by the carriers in their own behalf, the commission, as an administrative tribunal, was in duty bound to

develop and affirmatively to consider it—as a matter of precedent at least, even if it were found that its weight in this particular case was negligible. When the character of the miscellaneous assets of the ordinary carrier is considered, the importance of this point becomes obvious. For the most part the prime function of common carriers is the business of transportation, and their investments are usually made with the idea in mind of promoting their transportation business. As a result, such investments of themselves are ordinarily productive of very small returns.

The commission's accounting rules require that a reserve be accumulated out of each year's income sufficient to provide for the replacement of equipment when it becomes necessary to retire it, and admit of similar procedure to provide for the retirement of all other perishable property. If it were possible to conform these accumulations to the physical depreciation of the property, and these sums were immediately reinvested in new property devoted to transportation operations, it would be plain that the original investment was being intact, that new property was constantly being provided of a value equal to the depreciation—the loss in value—of the old. But in actual practice it is neither feasible nor desirable to accumulate depreciation funds in conformity with the erratic course of physical depreciation, or to restrict the use of such funds to investments in road and equipment. Higher considerations demand that available funds shall be used where they are most needed. Cash must be provided to meet current bills, and much good money is tied up in uncollected accounts and in material and supplies. These form a part of the investment of the carrier, no less than its road and equipment. Again, there may be excellent business reasons why available funds should be invested in property that does not directly serve the traveling or shipping public. These are conditions common to all business undertakings, so that, broadly speaking, may it not be justly maintained that the stockholders of a company are entitled to adequate return on the present worth of all assets (in excess of non-interest-bearing liabilities) utilized in the conduct or the development of transportation service; and that to whatever extent this is not provided from other sources it should be furnished by revenues derived from transportation operations: always provided, as a matter of course, that the affairs of the company have been managed honestly and to the best of the ability of the officers to whom they have been entrusted, and that depreciation funds accumulated out of the transportation revenues of the past have not been diverted to projects foreign to the service of the public?

Apparently, the commission does not hold this view, since while not called upon to consider an allowance of adequate returns on working capital, it did directly disallow a claim for return on one class of collateral investments.

We also note that among the terminal facilities of this road is an item of 2,033.63 acres of land costing \$3,581,368.44, but entered in the valuation at \$1,823,713, held for future terminal facilities. Whether the present shippers of ore should be called upon to pay seven per cent on the value of lands held for the possible future use of a carrier that faces "certain extinction" is open to question.

The commission's comment on the probability of the extinction of the carrier in question is apparently not to be taken seriously, as the opinion later discloses that this carrier's future seems to the commission to be well assured.

If the commission's comments in this connection indicate its attitude, the result is likely to prove an uneconomic one. Manifestly, if the public is not to be called upon to assume the cost of carrying property purchased for future needs in transportation of two things; either to add to the cost of such property a fair rate of interest on its purchase price from the time acquired until actually put into use for transportation service, or to capitalize the accretion in its value during the period it is held. Either of these plans of reimbursement to the stockholders—while proper enough in theory, in that they assign to the transportation service of each fiscal period only the facilities devoted to its accomplishment—will produce a credit to the profit and loss account of the company not accompanied by any increase in

* An article in the *Journal of Accountancy* for September.

funds available for dividend distribution. Such funds could be secured only by borrowing them, and obviously it would be difficult to borrow money at reasonable interest rates on the security of a mere increase in the book value of fixed assets. Hence, whenever the amount involved be large, the tendency, regardless of the economy of doing so, will be to withhold the purchase of property until it is immediately required, so that there will be no doubt as to its productivity in money as well as in figures.

In addition to finding that the carriers were entitled to earn a return only on the part of their property consisting of road and equipment, the commission apparently disallowed all claims for return on such property when its cost was charged to operating expenses at the time it was constructed. In this connection it was said:

The engineer who made this estimate testified in the present case that adaptation and solidification of roadbed represented an element of value which is properly included in the valuation of the road, notwithstanding the fact that the cost of same was charged to operating expenses.

It is true that the added value of an adapted and solidified roadbed is no less real if charged to operating expenses than if charged to capital account, but it is a question whether in this case we can reasonably include in a valuation that which a company has voluntarily chosen to regard as an operating expense, as something charged off for the year and not as a new investment.

Here we have laid down as a rule the apparently sound dictum that one cannot eat his cake and have it, too. But to the extent that the value of property acquired at the expense of operation may go to equalize the depreciation of property acquired by capital investment, it manifestly must be allowed, for it is fundamental that the capital investment must be kept intact out of income as a first consideration to the continued operation of the property.

It may be that certain unduly favored companies have in the past been able to accumulate additional property out of income far in excess of all depreciation of their capital investment, but as to such let it be said that the public has at least secured greater benefits from having these earnings plowed under than would have resulted if they had been dissipated in dividends as they might very well have been in the days of *laissez faire*.

Is it to be said of those companies that have withheld from their dividend envelopes enough more than niggardly to maintain their properties that they have burned the candle at both ends; that having once decided to forego capitalizing the part of the cost of renewals which contributed to upbuilding their properties they must now relinquish all claim on the public for a return on the money so invested; that because the income of past years has been sufficient to carry these charges, the public has discharged its debt to them in full; while other roads, which until the law made it criminal to do so longer may have capitalized even a large measure of their maintenance cost, shall suffer no such penalty? Whatever else may be true, the paramount fact remains that every past charge to operating expenses in excess of bare maintenance, whether betterment expenditure or excessive depreciation charge, represented a voluntary investment in the business which, being voluntary at the time it was made, should not now be confiscated because its result may have been for a while to conceal profits in excess of such as may now be claimed of right.

Except in certain unusual cases, would it not be just, in placing a value on a carrier's property for rate-testing purposes, to accept the fairly depreciated present replacement cost of its entire owned and leased railroad property as it is found by the government's engineers physically to exist after making proper allowances for depreciation accrued during the construction period and any other items of development cost that would be necessary incidents to a reproduction of the property? This is the true basis on which the property would change hands between a willing buyer and a willing seller if the factor of earning power could for the moment be excluded. Hence it is the true intrinsic value of the railroad as private property, which, being dedicated to public use, should not be confiscated by the public through reduction of the earning power of its service rates below the level necessary to produce a fair return on this value. To set up instead, as a common standard of value, the

worth of only such property as has been acquired by "capital investment" in the absence of a prior agreement or obligation to do so, would deny the legal necessity and the economic demand that the private character of the ownership of the property be governing. Moreover, it would too nearly amount to changing the rules after the game had begun, with the result that for certain individuals the government would relatively relieve them from the normal penalties of their improvident business practices, since for others it would expropriate the promised rewards of what were otherwise the far-sighted and judicious conservation and development of their property. And to do this were un-American.

TRADING GOLD FOR BRONZE PENNIES AND LOCOMOTIVES FOR COPPER ORE

By Walter S. Hiatt

Our Special European Correspondent

The railways play odd roles and are affected in curious ways by the war.

In connection with the effort of the allies to blockade Germany, an amusing incident is related of the attempt of the Germans to sell some old locomotives to a Norwegian company for copper ore. The company, which operates locally about Kragenro, met the offer of the Germans and agreed to buy the locomotives at a certain price. When the locomotives were delivered, however, the Germans requested that payment be made in copper ore. As there exists, officially, an order against the exportation of copper, the Norwegian company declined to comply. Then the Germans insisted that they be given at least as much copper as there was in the locomotives. The Norwegians refused to do this, and for the same reason. Next the Germans asked that payment be made in copper and bronze money, against which the Norwegian government had not issued a non-exportation order. According to the reports, the Norwegians were also proof against this modest if not innocent deception.

Germany needs copper so badly for war purposes that she has long since used up whatever copper money she may have had, as well as her nickel money, replacing the two by iron coins. At the present time she is actually paying gold for copper money delivered to her from her neighbors. An immense contraband traffic in money has been going on for the past four months, so immense that there are hardly any copper or bronze pennies left in Belgium, France, Italy or Spain.

In Paris, for instance, the railways, the stores and other public money changers have been compelled to refuse to make change to passengers buying tickets, and at least require the passenger to state first that he has no change. At the ticket windows of the Metropolitan and Nord-Sud subways for several weeks copies have been posted of the law of April 22, 1790, which states that the buyer of an article must provide the necessary change. This law was, of course, framed originally to protect the seller against debased coins or depreciated paper money. In November, the French government, its own mint being short of copper to make new coins, stated that the copper coins of any country might be accepted as legal tender.

The lack of copper money has embarrassed the railroads not only at Paris, but all over France, where the supply has become so limited that some cities have been forced to issue bills in two-cent, five-cent or ten-cent denominations. In many stations and stores postage stamps are accepted and given as change for silver money.

It appears that this copper drainage has been effected principally through neutral Switzerland, where the people, with much of their normal commerce cut off, must make a living as best they can. The process has been very simple. Merchants or small bankers let it be known among store cashiers, railway ticket sellers and the like that they would pay a small premium on copper coin. Immediately the copper coins began to flow in

their direction. They put them up in boxes and sent them as freight to the agent for which the merchant or banker was the intermediary. In some parts of France bordering on the Swiss frontier bankers' agents has been known to appear on the big market days and publicly buy sack after sack of these coins.

The drainage has made itself so felt that now in Paris copper and bronze coins, once considered a nuisance because of their plentifulness and weight, are so scarce that the railways wishing to keep the goodwill of their passengers must pay a premium in order to get coins to use as change. In France it is estimated that before the war there were no less than three billion copper and bronze coins, of all dates, valued at \$30,000,000.

The sore need of Germany for copper can easily be reckoned when it is considered that the normal price of copper is about 15 cents a pound, whereas a pound of copper or bronze pennies now costs the buyer 80 cents, plus the gold exchange.

The German copper famine comes not only from her excessive and lavish use of all kinds of war munitions, but from the fact that she normally does not mine what she uses, her output being 55,500,000 lb. as compared to the 120,000,000 lb. of Spain and Portugal and the 1,250,000,000 lb. of the United States.

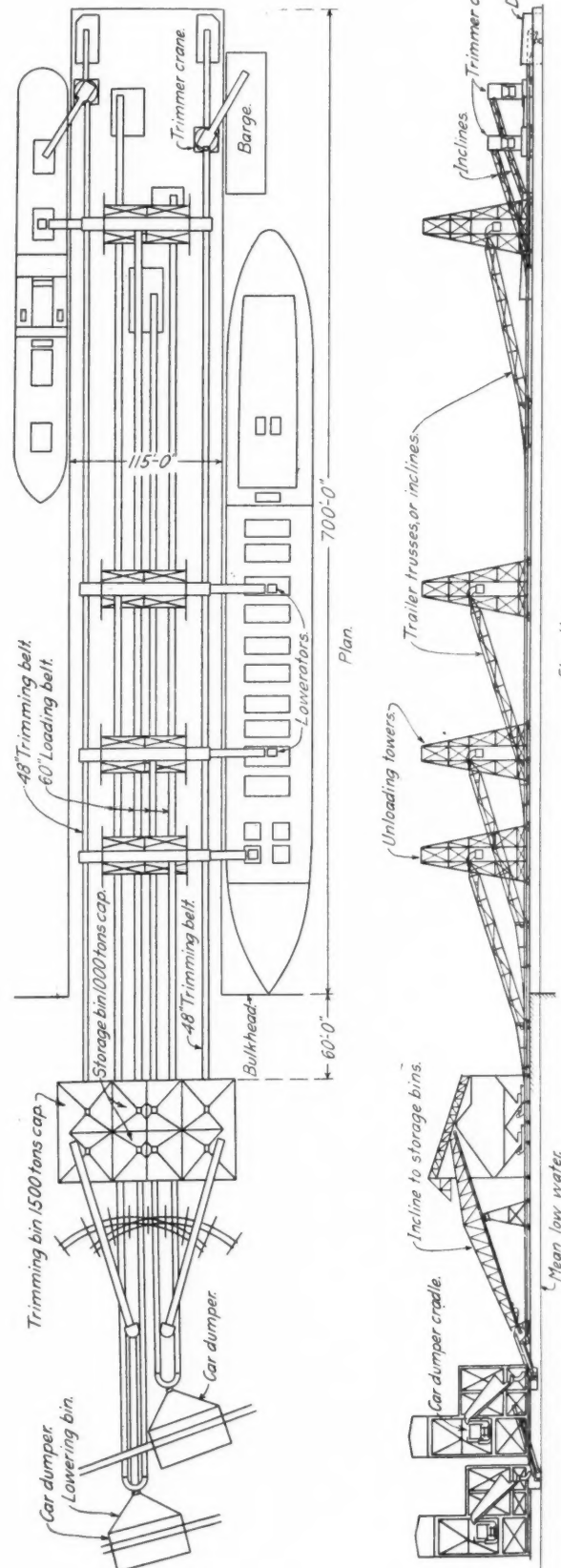
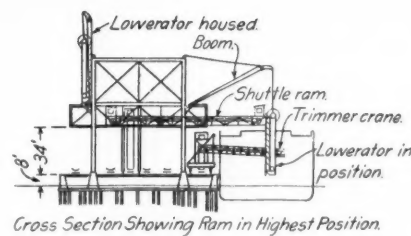
A NEW COAL PIER FOR THE BALTIMORE & OHIO

The Baltimore & Ohio is to build a new coal pier at the Curtis Bay terminal at Baltimore. Contracts have been let for the conveying machinery, and it is expected that other contracts will be awarded for the pier proper in time to put it into operation during the export season of 1916. The coal storage and classification yard in connection with this terminal will be increased in size to provide capacity for 300 additional loaded and 200 empty cars, making the total capacity of the yard 4,000 cars. The equipment for handling coal will be materially different from any now in use on the Atlantic seaboard.

The new pier which will be located 400 ft. from the present one, will be 700 ft. long and 115 ft. wide with its top 8 ft. above mean low water. Two car dumpers having a capacity of forty 100-ton cars per hour each will dump coal from the loaded cars into counterbalanced bins from which it will be fed on to six 60-in. belt conveyors which will carry the coal out onto the pier. Four of these conveyors will serve an equal number of loading towers, each belt running up onto a tower over an incline with an arrangement of pulleys that will permit the tower to move back and forth along the pier without interfering with the operation of the belt. Each loading tower will contain an elevator cage having a vertical movement of 27 ft. which, in turn, will contain a second cage known as the shuttle ram, having a length transverse to the pier of 118 ft. and containing a transverse belt conveyor. This shuttle ram will be capable of motion that will give it a maximum extension beyond the bulkhead line of 35 ft. on either side. On each side of the tower there will be a boom supporting a lowerator or boot for lowering the coal into a vessel, as it is delivered from the transverse belt in the shuttle ram.

Two of the 60-in. belts will carry the coal to storage bins located on the pier between the coaling towers and the car dumper. These storage bins will provide for continued operation of the car dumpers at times when it is necessary to stop any of the belt conveyors or loading towers temporarily. Coal from these storage bins will be dumped back on any of the four 60-in. belts leading to the loading towers or unto two 48-in. belts leading to two trimming towers, one on each side of the pier. These are to be used for trimming purposes or for supplying bunker coal while the towers are loading cargoes.

This arrangement will provide very flexible operation and is expected to reduce breakage on coal intended for domestic purposes, although the equipment may be speeded up when mine run coal is handled. The entire improvement will cost \$1,500,000, and the maximum capacity will be considerably in excess of the present demand.



STARTING HEAVY TRAINS ON THE NORFOLK & WESTERN ELECTRIFIED LINE

From the time electrification of steam roads was first discussed, a problem of primary importance appeared to the engineers studying the application of motors to heavy traction use: How can the equipment be suitably designed and the application properly made for one or more electric locomotives to start a long and heavy train?

With the advent of the superheater and the stoker Mallet locomotive, heavier rails and more substantial drawbar construction, the length and weight of trains has increased enormously. On roads in mountainous sections with sharp curves, it is frequently impossible to transmit signals by sound from one end of the train to the other. The starting of these trains on heavy grades became one of the biggest problems in steam locomotive operation. There was evolved a fairly satisfactory system of train signalling. The head-end locomotives, after the whistle signal had been formally given, let down slack along the train clear through to the rear engine, which was either standing on brake or on steam "against" the train. Following this, the head-end engine would gradually start ahead taking up slack until the full power of the locomotive was reached, which might have been over three-quarters of the train, or until such time that the effort of the rear-end engine, on which it is presumed steam was applied at the same time, met the effort of the head-end engine. Frequently it occurred, however, that there would not be coincident starting of the two engines, and several efforts at starting would be necessary.

Watching several powerful Mallets attempt to start a long train in this way was usually sufficient to convince the lay engineer that it would be sheer foolishness to attempt such a task with electric motors. Many early experiences with direct current motors confirmed this view.

But the electrical engineer was equal to the emergency. Years before heavy electric traction problems came into prominence there had been developed and put into exceptionally severe service the squirrel-cage or slip-ring type of alternating current motors. To determine the maximum possibilities and the ultimate characteristics of these motors, thousands of severe tests had been made both in laboratory and in actual service. In the laboratory or on the testing floor, it was one of the common tests to run a "locked saturation" test on the alternating current motor. This test involved locking the rotor of the motor through mechanical means so that it could not revolve when current was applied to the machine. Voltage and current loads were then applied under this condition from a minimum amount, tending to cause just a little "pull" from the effort of the rotor to turn, to the maximum voltage and current which the motor could withstand in its extreme physical and electrical possibilities. This always involved applying from two to three times the maximum amount of voltage and current under normal free operating conditions. These severe tests were found to be not seriously detrimental to motors of rugged construction, for the alternating induction type of motor involves no delicate commutating devices or parts to be burnt or destroyed while being tested in this condition.

Here, then, in this character of motor, rugged and efficient, was the ideal means for producing conditions parallel to those which prevailed with the steam engine under an application of steam "standing against" the stationary train.

The three-phase induction type, slip-ring, alternating current motor, mentioned above as the ideal motor to meet the excessively severe conditions in starting a long, heavy train on steep grades, is the character of motor installed in the 270-ton Baldwin-Westinghouse locomotives operating on the Elkhorn grade of the Norfolk & Western. To see the starting of one of the 3,250-ton trains on the two per cent grade section of this line, with one electric locomotive on the head-end of the train and a second electric locomotive at the rear, is very impressive. The ease, the entire freedom from confusion and absence of "jockeying" with

which these locomotives give up and take up slack in a train, and the smoothness and steadiness with which they accelerate the train to 14 miles an hour, is indeed wonderful. Rarely is it necessary to make more than one attempt at starting.

The apparently impossible as set by the Mallet locomotive is here accomplished every day.

NEW YORK COMMISSION REPORTS

The New York State Public Service Commission, First district, has issued its ninth annual report. This commission confines its activities wholly to the territory within New York City and the construction of new subway and elevated railroads occupies a large share of its attention. Contracts have been let by the commission during the year for new work of this kind amounting to \$26,096,638; and the aggregate value of such work done since the commission first took charge has been over 167 millions. The expenses of the commission during the year amounted to about \$3,600,000, of which five-sixths was devoted to this rapid transit work. Of the 2,300 employees of the commission, about 2,000 are employed exclusively on the preparation of plans for the new lines and the inspection of the work done by contractors.

The commission has issued an order, which will be fully complied with within three months, requiring that no wooden cars shall be run in the subways. Approvals of new issues of stocks and bonds during the year have amounted to \$23,000,000. The number of complaints received during the year was 5,732, or 704 less than in 1914. About one-fourth of the complaints related to transportation matters.

The commission proposes to approve work for the elimination of highway grade crossings during 1916 amounting to about \$2,000,000, and the legislature is asked to appropriate \$500,000, the usual custom being for the state to pay one-fourth of the expense of improvements of this kind.

SECOND DISTRICT

The Commission for the Second district (all of the state outside New York City) sent its ninth annual report to the legislature January 10. The commission has disposed of all of the old cases which have been pending for a long time, has released nearly a half million dollars tied up in a dispute with the New York Central over payments for the elimination of the Yonkers grade crossings and has entered upon the administration of the so-called Thompson jitney bus law, which brought all vehicles of this character under the jurisdiction of the commission as common carriers. In the Yonkers matter the commission congratulates the state on the fact that grade crossing elimination work of a total cost of nearly \$2,000,000 has, "with the generous co-operation of the railroad corporation," been accomplished; and with an incidental outlay of only \$138,000 on the part of the state.

The total number of applications and complaints to the commission for the year has been 1,997, and 2,184 cases of all sorts have been disposed of. The commission held 578 hearings on 352 days; 256 hearings in Albany, 84 in New York City, 150 in Buffalo, and 86 in other places. The expenses of the commission during the past year (ending Sept. 30, 1915) were \$438,000. For the current fiscal year (ending Sept. 30, 1916) the appropriation is \$394,000, and for the next fiscal year the commission has requested but \$392,000. There are now 928 public utility enterprises under the jurisdiction of the commission.

The commission has adopted the form of annual report for railroad corporations prescribed by the Interstate Commerce Commission. There were but nine passengers killed on the steam roads of the state during this year and all of these were killed either getting on or off trains in motion and none in a train accident. There has been a gratifying reduction in the number of grade crossing accidents. The grade crossing division reports that \$1,500,000 will eventually be needed to complete the elimination work now in hand.

Railway Age Gazette

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General News Department

The Atlantic Coast Line now employs train auditors.

The Delaware & Hudson has made an increase of one cent an hour in the pay of 2,000 shopmen, to take effect February 1.

Samuel O. Dunn, editor of the *Railway Age Gazette*, addressed a noon meeting of the Railroad Y. M. C. A., Chicago, on Tuesday, January 25, on "The Railway Situation in the United States."

Near Lynchburg, Va., last Sunday, the Southern Railway lost by fire 24 empty freight cars standing on a side track waiting to be sent to the shops for overhauling. A few weeks ago 28 cars were burned under similar circumstances at the same place.

The Public Service Commission of West Virginia has authorized the Western Maryland to charge 2½ cents a mile for the transportation of passengers in that state; and to continue collecting ten cents additional on each fare from passengers paying cash on trains.

The Syracuse Grade Crossing Commission has retained Bion J. Arnold, consulting engineer, of Chicago, to make a study of the grade crossing problem of Syracuse. Mr. Arnold and his assistant, James R. Bibbens, have been in Syracuse investigating the situation.

Some station agents who met in Boston last week, and who say that they represent the "Order of Railroad Station Agents," with 5,000 members, voted to make a demand on all the railroads east of Buffalo for an eight-hour day and time and a half pay for all overtime.

Railroad service in Northern Illinois was interfered with to some extent on January 21 by floods in the valleys of the Des Plaines, Du Page and Fox rivers, resulting from a heavy rain on the night of January 20, which was not absorbed by the frozen ground and rapidly filled the streams to overflowing. Railroad tracks were inundated at many points and there was some damage to small bridges.

The Southern Railway Company has received from the University of Cordova, Argentina, a handsome silver medal, conferred in recognition of the efforts of the railway company to promote international trade relations between South America and the United States, and specially of the noteworthy results of those efforts in connection with the stimulation of the study of Latin-American history and literature in the colleges of the United States.

Massachusetts state inspectors reported, in the 12 months ending December 31 last: 777 forest fires in that state which were set by railroad locomotives. The Boston & Albany is charged with setting 156; the Boston & Maine, 261; the Central Vermont, 58, and the New York, New Haven & Hartford, 302. The fires burned over 7,543 acres and cost \$7,782 to extinguish. They caused a damage of \$32,624. The damage exceeds that of former years. The length of railroad in the state is about 2,130 miles.

The Buffalo, Rochester & Pittsburgh has retired and put on the pension list three veteran highway crossing watchmen who have been in the service of the road 23, 31 and 26 years, respectively; and the announcement calls attention to the fact that on this road pensioners receive, for each year of service, 2 per cent of their average pay for the preceding ten years. This is twice the amount paid by most roads. Moreover, an employee has the privilege of retiring at the age of 65 if he has been in the service 20 years. Retirement at 70 is compulsory.

The station agent and a telegraph operator employed by the New York, New Haven & Hartford at Congamond, Mass., who decamped suddenly on January 14, and who have been arrested and brought back to appear for trial, have been charged with not only stealing money from the company but with taking and selling freight in cars and in the freight house and with selling the station building. Congamond is a very small place, and the station building, presumably, is not a costly structure. Soon after the departure of the runaways an Italian appeared, to take possession of the building, saying that he had paid for it \$50.

Robert C. Wood, former member of the New York State Public Service Commission, First district, who recently resigned, following an investigation of his conduct by a legislative committee, was this week indicted by the Grand Jury, in the Court of General Sessions, New York City, the charge being that he had endeavored to obtain a bribe from the Union Switch & Signal Company when a bid from that company, for supplying signal material for the Fourth avenue subway, Brooklyn, was pending before the commission. The testimony leading up to this indictment was reported in the *Railway Age Gazette*, December 24, page 1206, and January 7, page 31.

A syndicate of Buffalo and New York financial and shipping interests is reported to have been negotiating with the New York Central, Pennsylvania, the Erie and the Lehigh Valley railroads for the purchase of the remaining vessels which formerly comprised the joint water lines of the carriers on the Great Lakes. A number of the boats had already been sold. William J. Conners, of Buffalo, is said to be the active head of the syndicate, which has made an offer for the vessels with a purpose of taking them over for operation on the Great Lakes by an independent corporation. The Interstate Commerce Commission's order requiring the roads to give up the ownership of their lake lines took effect on December 15.

The Sunset-Central Lines have prepared an extensive programme of improvements for the coming year, which will include the laying of 39,703 tons, or 281 track miles, of 90-lb. rail already purchased, and track fastenings, at an approximate cost of \$2,066,000. In addition the following items of expenditure are contemplated: new steel bridges, \$50,000; water and fuel stations, \$75,000; ballast, 150 miles of track, \$300,000; shop buildings, \$217,000; shop machinery and tools, \$141,000; station and other buildings and signals, \$60,000; additional side tracks and spurs, \$220,000; docks and wharves, \$25,000; equipment of 5,400 freight cars with safety appliances, \$97,000; equipment of 15 locomotives with superheaters, \$27,000; reinforcement and rearrangement of interior of mail cars, \$6,000. The principal shop building will be erected at Algiers, La.

President Wilson Before the Railway Business Association

President Wilson was the only speaker on Thursday night at the annual dinner of the Railway Business Association. George Post was toastmaster and there were present 550 members and guests of the association. The dinner was a great success and the President was warmly received.

United States Steel Corporation

The United States Steel Corporation reports gross earnings for the three months ended December 31, of \$51,232,788; and the directors of the company have declared a dividend of 1¼ per cent for the quarter on the common stock, the first dividends on this stock for a year.

The gross earnings for the quarter amount to \$5,729,084 more than those of any previous quarter and nearly five times as much as the earnings in the corresponding quarter in 1914. The gross earnings for December were more than ten times as much as those for January, 1915. The unfilled orders on the books the first of this month amounted to 7,806,220 tons.

Freight Congestion

The Boston & Albany has taken east from Albany during January an average of 1,025 cars of freight, daily, which is 207 more than the average daily number during the year 1915. Vice-President H. M. Biscoe has issued a bulletin, thanking the men for the extra work required, in which he says:

"That this amount of traffic was handled during a period of snowstorms and zero temperature and without interruption to the heavy passenger traffic reflects great credit on employees and officers alike. The management has been mindful of the demands that such a movement of traffic has made upon the employees, and desires to acknowledge its appreciation to all who by their services have made this performance possible."

The company has removed the embargo on freight which was issued on January 5, except on perishable goods going to points on the New Haven road, and live stock destined for the Boston & Maine docks at Boston.

The New York, New Haven & Hartford has modified the embargo on freight from west of the Hudson River and expects

by the end of the present week to be able to take everything offered; but consignees have been notified that except by energetic co-operation of shippers, carriers and consignees it will be impossible to avoid reimposing the embargo.

American Association of Demurrage Officers

The annual meeting of the American Association of Demurrage Officers was held at Atlanta, Ga., on January 18. The subjects discussed were mainly of a routine nature, including the consideration of several proposed changes in demurrage rules and interpretations, on which recommendations were adopted to be submitted to the Committee on Relations Between Railroads of the American Railway Association. M. W. Rotchford, manager of the Western Demurrage & Storage Bureau, Chicago, was re-elected president; L. K. Plosser, manager of the Alabama Demurrage & Storage Bureau, Birmingham, Ala., was elected vice-president, and F. A. Pontious, supervisor of demurrage, Chicago & North Western, Chicago, was re-elected secretary.

A Government Safety-First Exhibit at Washington

Secretary Franklin K. Lane announces that there is to be held in Washington, February 21-26, a "safety-first" exhibit. It seems to be intended largely as a means of promoting the efficiency of the Bureau of Mines, though it is said that all of the government departments are taking an active part. Manufacturers and operators from all over the country are invited to be present. Secretary Lane has sent a letter to the governor of each state inviting him to send a delegate, and asking that the chief mine inspector, a representative of the industrial commission, or of other agencies engaged in compiling statistics relating to mineral industries, also attend this exhibition. On the 24th there will be a conference of state mine inspectors at the office of the Bureau of Mines, Department of the Interior.

June Mechanical Conventions.

During the past week 13,000 more sq. ft. of exhibit space at Atlantic City has been applied for, bringing the total to 35,000 sq. ft. The total space actually used last year was 70,772 sq. ft. Last year only about 17,000 sq. ft. had been applied for up to a date corresponding to last Wednesday when the above figures were compiled. Ten per cent of those who have applied thus far did not exhibit last year. A large number of companies which have never exhibited before have written for detailed information. From present indications it is essential, therefore, that those who expect to exhibit make application at once, and, in any event, not later than February 18, on which date the first assignment of space will be made. Applications should be made to John Conway, 2136 Oliver building, Pittsburgh, Pa.

Rock Island Fuel Department

A change has been made in the organization of the fuel department of the Chicago, Rock Island & Pacific in order that the mining, purchasing, distribution and consumption of fuel may be controlled in one department. Carl Scholz has been placed in charge with the title of manager of the mining and fuel department. He will report directly to A. C. Ridgway, chief operating officer of the road. D. B. Sebastian, as assistant manager, under Mr. Scholz, will be in charge of the purchase, distribution and consumption of the fuel. H. S. Mikesell will also be assistant manager in charge of mines. H. Clewer, as superintendent of fuel economy, will report to Mr. Sebastian. He will have direct charge of the consumption of fuel on locomotives and at stationary boiler plants. The road foremen of equipment, of which there are 23, will report to Mr. Clewer, and will do the field work in educating the engine crews and the employees at stationary plants in the economical use of fuel. There are three supervisors of fuel stations whose duties will be to see that the coal is handled at the various coaling stations in a proper and economical manner. They will be responsible for the operation of these stations, reporting to Mr. Sebastian. The inspection of the coal at the mines will be done by one chief inspector and three assistant inspectors. The chief inspector will report to Mr. Mikesell. By thus making one man responsible for fuel from the time it is mined until it is consumed, it is expected that the greatest efficiency in the use of fuel will be obtained.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER, 1915

NAME OF ROAD.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.)	Maintenance of Way and Structures	Equipment.	Traffic.				
Ann Arbor.....	301	\$197,662	\$43,495	\$241,157	\$19,140	\$28,915	\$4,738	\$15,867	\$12,800	\$89,521	\$60,868
Atlantic City.....	170	71,884	14,584	86,468	14,717	14,717	3,404	133,696	10,000	2,312	46,880
Baltimore & Ohio Chicago Terminal.....	79	54,548	26,642	81,190	17,808	17,808	3,388	18,757	17,654	29,416	24,435
Baltimore, Chesapeake & Atlantic.....	88	54,548	26,642	81,190	3,304	42,276	1,869	2,603	2,300	19,894	6,059
Belt Ry. Co. of Chicago.....	26	11,571	5,335	16,906	15,970	22,187	862	10,758	11,758	11,758	32,478
Buffalo & Susquehanna Railway.....	91	11,571	5,335	16,906	4,230	8,441	403	10,896	1,600	8,645	4,111
Canadian Pacific Lines in Maine.....	233	90,305	121,104	211,409	17,076	16,620	4,550	88,575	12,000	20,229	24,085
Carolina, Clinchfield & Ohio.....	283	215,035	14,974	230,009	27,090	8,766	38,890	106,677	14,250	113,569	47,191
Carolina, Clinchfield & Ohio of S. C.....	18	12,432	1,484	13,916	627	71	1,963	815	750	7,530	3,830
Central of New Jersey.....	681	2,366,498	442,740	2,809,238	279,339	467,338	28,487	937,394	116,989	1,032,088	364,047
Central Vermont.....	411	251,127	67,689	318,816	29,679	57,118	8,311	151,331	15,300	75,971	35,778
Chicago & Eastern Illinois.....	1,282	1,172,062	222,515	1,394,577	155,776	349,961	26,706	483,472	45,424	388,936	244,012
Chicago & Erie.....	270	533,025	45,378	578,403	55,053	60,399	16,826	235,247	29,650	219,571	172,211
Chicago Great Western.....	1,427	963,179	257,470	1,220,649	177,209	223,341	45,338	310,988	45,442	363,251	145,467
Chicago Junction.....	13	815,946	124,991	940,937	17,936	18,245	923	102,808	2,266	49,457	24,172
Cincinnati, Hamilton & Dayton.....	1,003	815,946	124,991	940,937	183,916	230,648	20,176	304,009	35,199	171,949	106,391
Cincinnati, New Orleans & Tex. Pacific.....	357	759,325	132,759	892,084	95,156	240,323	24,534	255,046	32,000	265,598	104,979
Colorado & Southern.....	1,069	693,209	143,709	836,918	80,589	142,071	9,554	214,227	3,565	309,583	66,900
Cripple Creek & Colorado Springs.....	2,577	1,734,499	379,269	2,113,768	11,788	12,490	3,393	28,621	4,393	34,422	14,542
Denver & Rio Grande.....	255	154,747	19,099	173,846	170,305	339,771	41,287	595,452	1,022,795	932,643	275,088
Denver & Salt Lake.....	81	142,129	181,293	323,422	18,805	30,211	1,448	66,850	7,379	52,291	560
Detroit & Toledo Shore Line.....	441	175,328	12,450	187,778	13,039	8,815	1,651	35,043	5,575	76,260	18,489
Detroit, Toledo & Iron Range.....	273	380,673	23,179	403,852	199,685	25,956	4,252	77,442	5,500	60,779	70,715
Duluth & Iron Range.....	628	168,230	69,567	237,797	416,980	81,279	960	142,991	25,734	97,693	212,248
Duluth, South Shore & Atlantic.....	187	84,714	21,755	106,469	36,016	32,199	6,986	95,477	17,000	61,993	56,179
Duluth, Winnipeg & Pacific.....	1,988	4,481,127	711,278	5,192,405	135,069	149,700	1,509	39,501	5,534	28,139	15,011
Erie.....	745	311,773	104,521	416,294	335,166	679,969	90,696	1,897,131	165,174	2,390,881	1,550,045
Florida East Coast.....	1,351	833,735	282,363	1,116,098	185,358	152,005	37,443	411,261	35,301	114,539	17,677
Galveston, Harrisburgh & San Antonio.....	13	202,379	70,755	273,134	2,558	1,414	355	28,248	37,823	28,605	58,210
Georgia.....	307	202,379	70,755	273,134	24,815	40,958	11,892	104,602	33,303	70,310	28,872
Grand Rapids & Indiana.....	575	319,845	116,099	435,944	50,118	76,577	9,640	182,332	21,660	112,098	61,216
Great Northern.....	8,102	7,186,122	1,259,382	8,445,504	385,949	693,528	87,852	1,967,741	478,224	54,922	2,430,729
Gulf & Ship Island.....	308	133,525	26,834	160,359	168,942	26,763	2,901	38,415	6,013	70,608	45,412
Hocking Valley.....	351	555,116	669,049	1,224,165	68,052	147,692	7,971	185,339	37,400	208,741	95,177
Houston, East & West Texas.....	191	98,874	29,571	128,445	31,687	18,911	2,016	40,367	311	39,936	25,003
Houston & Texas Central.....	895	439,249	122,616	561,865	81,404	93,660	13,044	198,939	28,303	167,110	42,482
Illinois Central.....	4,767	4,157,003	1,081,587	5,238,590	859,464	1,484,698	109,458	1,858,908	285,700	1,233,655	423,331
Kansas City, Mexico & Orient.....	798	217,003	39,604	256,607	29,666	32,664	8,233	21,182	11,775	39,649	23,516
Lehigh & New England.....	296	298,279	1,086	300,000	31,788	32,664	1,820	72,991	6,200	102,044	73,244
Lehigh Valley.....	1,442	3,440,651	312,522	3,753,173	422,312	890,843	88,135	1,541,304	142,000	1,181,048	360,627
Louisiana Railway & Navigation Co.....	351	187,263	32,657	219,920	32,715	30,036	5,973	68,336	9,300	82,004	57,179
Louisiana Western.....	208	188,642	52,819	241,461	23,967	26,678	7,911	58,655	9,616	112,133	69,242
Minh, St. Paul & Sault Ste. Marie.....	4,229	3,109,019	564,367	3,673,386	229,494	340,717	59,909	944,209	172,623	2,057,847	1,148,054
Missouri, Oklahoma & Gulf.....	334	132,320	21,128	153,448	49,733	26,886	4,401	53,075	5,128	11,696	1,487
Missouri, Oklahoma & Gulf of Texas.....	125	23,127	482	23,609	4,165	2,007	11,784	11,784	140	1,833	—1,337
Missouri Pacific.....	3,931	2,174,567	398,808	2,573,375	463,663	520,880	60,170	958,533	102,103	612,196	151,406
Monongahela.....	108	158,642	7,244	165,886	21,432	16,773	1,136	34,337	11,530	70,241	25,087
Morgan's L. & Texas R. R. & S. Co.....	405	340,554	81,024	421,578	55,339	74,141	12,748	149,866	21,916	123,247	35,699
New Orleans, Mobile & Chicago.....	402	149,569	23,081	172,650	23,625	29,208	4,191	52,470	7,231	56,928	12,115
New Orleans Great Northern.....	255	104,409	25,321	129,730	18,515	25,230	2,717	41,009	2,779	6,100	6,100
New York Central Railroad.....	5,969	11,592,226	3,751,153	15,343,379	1,601,607	2,801,196	239,686	5,209,488	621,999	6,100,950	45,658
New York, Susquehanna & Western.....	140	225,551	50,492	276,043	40,483	29,101	1,884	127,939	15,114	85,317	45,658
Norfolk Southern.....	908	280,992	165,535	446,527	51,763	54,857	7,612	128,084	12,251	123,701	66,121
Northwestern Pacific.....	507	140,272	165,535	305,807	56,735	35,926	4,866	122,698	17,191	101,669	65,564
Oregon Short Line.....	2,259	1,701,419	354,913	2,056,332	268,036	260,012	43,872	488,340	151,493	1,001,702	348,835
Oregon-Washington R. R. & Nav. Co.....	2,027	1,111,382	347,708	1,459,090	185,366	185,366	55,786	455,355	12,621	388,738	74,234
Panhandle & Santa Fe.....	1,670	1,112,392	84,140	1,196,532	67,490	61,118	1,187	259,515	13,510	216,592	159,558
Pennsylvania Company.....	1,757	4,740,560	847,146	5,587,706	722,367	960,635	76,615	1,889,774	241,988	2,103,535	1,721,909
Pennsylvania Railroad.....	4,528	3,748,827	3,302,952	7,051,779	3,322,088	3,322,088	191,842	6,295,261	657,301	5,091,550	2,483,608
Pere Marquette.....	2,248	1,439,147	303,712	1,742,859	141,681	346,791	30,483	621,499	47,010	674,004	335,890
Philadelphia, Baltimore & Washington.....	717	989,410	742,410	1,731,820	252,122	333,415	55,122	720,436	55,746	408,589	205,985
Philadelphia & Reading.....	1,120	481,362	541,959	1,023,321	338,578	338,578	52,569	1,512,713	100,186	2,174,764	982,012
Pittsburgh & Lake Erie.....	1,235	1,713,896	138,334	1,852,230	126,800	245,234	13,320	378,383	49,300	1,122,337	981,542
Pittsburgh, Cincinnati, Chic. & St. L.....	1,479	2,802,781	687,209	3,490,000	528,612	701,056	62,857	1,302,846	161,254	1,050,495	755,495
Pittsburgh, Shawmut & Northern.....	294	210,123	8,794	218,917	29,966	52,922	1,652	61,975	1,825	68,512	9,101
Port Reading.....	21	156,186	185,350	341,536	6,896	6,523	38	55,787	10,000	105,937	44,244
Richmond, Fredericksburg & Potomac.....	88	128,514	80,137	208,651	21,370	28,167	2,984	81,569	8,185	88,304	30,173
Rutland.....	468	180,238	90,713	270,951	36,067	44,468	8,195	108,710	16,555	91,575	25,558
St. Joseph & Grand Island.....	258	133,823	24,297	158,120	28,554	23,065	4,113	48,673	7,599	52,519	34,318
St. Louis & San Francisco.....	4,750	2,931,831	907,192	3,839,023	538,218	604,783	63,794	1,225,493	181,671	1,335,739	414,449
St. Louis, Brownsville & Mexico.....	548	133,632	59,979	193,611	43,051	25,234	5,372	67,420	13,500	49,474	17,397

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF NOVEMBER, 1915—Continued

NAME OF ROAD.	Average mileage operated during period.		Operating revenues		Maintenance of		Operating expenses		General.	Total.	Net from Railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) income comp. with last year.
	Freight.	Passenger.	Total.	(Inc. misc.)	Way and Structures.	Equip-ment.	Traffic.	Trans-portion.						
St. Louis, Iron Mountain & Southern.....	3,363	\$2,428,659	\$502,551	\$3,129,834	\$446,297	\$543,377	\$53,559	\$807,767	\$61,519	\$1,917,239	\$1,212,644	\$11,086	\$1,098,886	\$417,367
St. Louis, Merchants' Bridge Terminal.....	244	85,820	21,317	114,938	30,373	5,396	751	42,950	6,415	125,019	63,419	13,000	50,319	26,864
St. Louis, San Francisco & Texas.....	943	605,459	122,175	767,003	24,624	17,431	2,117	165,672	4,385	91,506	23,084	2,661	20,423	11,933
St. Louis, Southwestern.....	811	302,968	85,789	417,975	62,691	76,401	14,676	158,523	2,584	386,433	380,520	29,825	350,489	174,685
St. Louis, Southwestern of Texas.....	811	302,968	85,789	417,975	62,691	76,401	14,676	158,523	18,918	324,944	93,031	15,024	77,971	103,054
San Antonio & Aransas Pass.....	724	280,809	85,611	390,756	72,775	53,340	6,625	158,991	12,306	304,292	86,524	20,000	66,393	75,476
San Pedro, Los Angeles & Salt Lake.....	1,147	604,313	200,926	894,700	73,968	127,969	32,618	288,907	17,405	326,045	368,555	91,849	316,456	149,454
Seaboard.....	3,123	1,429,381	383,769	2,011,155	249,872	291,066	1,591	651,958	60,852	1,354,968	670,090	92,278	583,593	198,789
Southern.....	7,022	4,194,294	1,299,990	6,009,147	697,069	883,027	189,990	1,932,579	183,448	3,820,680	2,188,468	241,570	1,943,353	770,188
Southern Pacific.....	6,926	6,512,777	2,979,408	10,371,167	1,115,648	1,381,600	189,386	2,984,442	250,380	6,068,536	4,302,631	459,507	3,842,906	1,605,598
Spokane, Portland & Seattle.....	555	276,025	106,591	419,329	33,644	34,660	7,390	90,661	12,200	180,500	238,828	53,400	185,411	70,013
Staten Island Rapid Transit Co.....	11	49,959	21,835	71,794	18,914	7,242	634	38,045	2,574	67,409	30,127	5,000	25,127	8,130
Tennessee Central.....	294	94,726	28,014	130,801	27,891	15,980	5,539	50,897	6,569	109,874	20,926	4,682	16,231	16,145
Terminal R. R. Ass'n of St. Louis.....	37	242	242	252,131	44,661	11,100	864	79,076	4,187	139,889	112,242	24,335	87,905	15,907
Texas & New Orleans.....	468	270,756	89,185	394,906	65,770	77,190	9,933	143,970	8,620	315,320	79,586	27,005	52,225	59,388
Texas & Pacific.....	1,944	1,438,326	374,442	1,946,651	167,070	233,307	37,494	711,617	43,834	1,203,418	740,233	76,000	663,773	168,225
Toledo & Ohio Central.....	436	409,545	46,277	485,374	42,705	105,706	6,357	148,908	1,900	316,033	169,341	23,179	146,162	65,521
Toledo, Peoria & Western.....	248	60,698	36,269	102,721	15,315	29,480	2,330	38,176	3,774	89,075	13,651	6,100	7,551	17,541
Toledo, St. Louis & Western.....	451	451,960	26,905	506,318	75,582	53,919	16,801	148,306	8,598	303,206	203,162	17,400	185,762	140,479
Ulster & Delaware.....	129	57,651	11,792	87,436	9,251	8,765	920	32,497	2,745	54,239	30,197	3,500	26,697	23,944
Union Pacific.....	3,618	4,218,656	890,701	5,676,520	638,878	698,167	144,237	1,279,630	134,477	2,962,802	2,640,718	206,332	2,433,939	623,984
Union R. R. of Baltimore.....	31	134,086	21,387	157,226	22,009	40,311	4,691	60,743	2,293	28,993	128,233	3,421	124,812	24,335
Union R. R. of Pennsylvania.....	910	759,443	191,633	1,073,290	164,043	196,408	122,136	358,768	27,365	779,119	294,171	7,001	161,592	192,383
Vandalia.....	31	134,086	21,387	157,226	22,009	40,311	4,691	60,743	2,293	28,993	128,233	3,421	124,812	24,335
Vicksburg, Shreveport & Pacific.....	171	88,619	50,472	154,047	22,576	23,193	3,426	41,709	5,577	98,690	55,357	8,500	46,857	43,325
Virginia.....	501	477,701	13,477	542,189	60,285	107,176	4,911	110,428	13,735	319,270	231,930	20,000	211,913	73,303
Washington & Southwestern.....	2,510	2,169,638	483,331	2,881,098	310,053	401,580	73,515	1,093,717	6,353	1,947,714	933,354	6,905	1,442,359	34,264
Washington Southern.....	36	42,102	45,279	113,008	14,684	12,865	1,228	38,715	3,213	71,510	43,497	82,309	89,825	20,798
Western Pacific.....	941	461,086	100,305	664,035	58,920	67,174	21,050	204,743	20,873	388,089	275,946	21,129	254,745	195,222
West Jersey & Seashore.....	358	227,597	225,707	494,084	110,565	86,023	11,217	225,669	2,462	451,656	42,428	37,181	5,224	46,376
Western Maryland.....	664	744,631	66,094	840,596	110,510	141,823	22,201	271,633	2,198	567,973	278,613	28,000	250,613	134,590
Western Ky. of Alabama.....	133	926,209	237,342	1,215,255	197,891	215,225	62,481	481,394	117	1,003,577	250,966	67,500	183,384	117,917
Atlantic & St. Lawrence.....	167	440,645	131,756	626,737	104,037	92,728	18,569	279,020	18,696	517,070	103,667	57,525	52,132	4,942
Atlantic Coast Line.....	4,700	8,200,032	2,886,753	12,015,534	1,831,282	2,287,533	272,469	4,273,484	33,650	9,951,547	2,963,986	712,000	2,244,155	812,224
Baltimore & Ohio.....	4,535	36,822,343	6,080,351	46,875,542	5,337,901	9,537,154	807,780	14,382,167	985,016	31,300,037	15,575,475	1,412,246	14,153,953	4,286,243
Baltimore & Ohio Chicago Terminal.....	479	3,332	731,037	91,049	42,602	79,932	4,267	206,837	40,338	507,073	228,964	88,268	134,328	31,599
Baltimore, Chesapeake & Atlantic.....	88	343,077	220,449	587,239	86,279	123,835	3,174	485,760	16,218	530,584	56,655	11,398	45,251	68,105
Belt, Ry. Co. of Chicago.....	26	661	1,195,756	86,279	123,835	3,174	485,760	16,218	28,513	733,592	462,164	53,793	408,371	240,583
Belt, Ry. Co. of Chicago.....	26	661	1,195,756	86,279	123,835	3,174	485,760	16,218	28,513	733,592	462,164	53,793	408,371	240,583
Bangor & Aroostook.....	672	985,019	301,651	1,381,277	238,119	213,539	13,685	380,119	28,513	733,592	462,164	53,793	408,371	240,583
Bessemer & Lake Erie.....	205	5,547,422	179,980	5,894,485	384,370	815,727	47,212	1,125,244	60,789	2,380,539	3,414,805	83,929	3,330,952	748,059
Bingham & Garfield.....	207	824,191	15,211	842,681	82,162	73,650	4,855	103,958	9,744	277,948	554,735	22,239	542,493	268,345
Boston & Maine.....	2,302	12,416,330	7,019,172	21,374,211	2,777,277	2,693,895	183,605	8,411,311	492,346	14,580,455	6,793,755	802,577	5,991,179	1,828,429
Buffalo & Susquehanna R. R. Corporation.....	233	638,370	34,323	682,705	109,647	172,432	5,178	178,977	28,663	491,888	187,818	13,000	174,818	81,593
Buffalo, Rochester & Pittsburgh.....	586	4,286,881	502,463	4,969,487	837,288	1,080,924	58,511	1,455,032	101,346	3,543,948	1,425,559	100,000	1,325,501	247,755
Buffalo & Susquehanna Railway.....	91	76,453	31,534	120,201	23,142	29,424	2,292	37,057	11,694	123,557	3,455	8,000	11,462	15,144
Canadian Pacific Lines in Maine.....	283	282,767	89,115	410,305	47,015	67,015	2,092	167,793	18,741	388,809	21,495	60,000	83,505	46,041
Carolina, Clinchfield & Ohio of S. C.....	18	94,973	6,793	110,102	13,843	5,213	185,681	3,507	3,258	30,916	30,403	7,250	32,918	110,682
Central New England.....	304	1,805,351	201,352	2,087,651	259,499	150,893	5,802	532,694	23,088	973,311	1,113,335	64,000	1,050,324	710,845
Central of Georgia.....	1,924	3,464,243	1,323,315	5,297,629	694,940	838,895	173,550	1,711,276	191,314	3,634,441	1,663,188	264,263	1,395,063	346,078
Central of New Jersey.....	681	10,311,705	2,915,219	14,026,740	1,152,177	2,423,337	171,501	4,569,131	231,923	8,648,920	3,772,820	584,934	3,792,886	571,716
Central Vermont.....	411	1,152,126	439,100	1,735,102	221,999	256,430	45,667	702,494	34,670	1,300,870	434,232	77,950	366,265	106,645
Charleston & Western Carolina.....	343	539,432	142,830	719,453	132,629	90,427	16,075	240,420	22,852	502,353	217,103	25,000	192,092	65,787
Chesapeake & Ohio Lines.....	2,374	15,840,796	2,677,499	19,632,689	2,274,670	4,103,441	435	5,519,254	372,734	12,627,913	7,001,781	575,600	6,420,231	2,089,473
Chicago & Alton.....	1,052	4,531,569	1,732,332	6,830,735	854,401	1,434,832	176,453	2,202,384	49,790	151,542	1,983,923	217,007	1,769,036	280,506
Chicago & Eastern Illinois.....	1,282	5,236,661	1,263,824	7,045,225	1,017,139	1,698,883	176,453	2,202,384	190,051	5,312,696	1,732,529	270,500	1,460,545	42,851
Chicago & Erie.....	270	2,620,627	265,026	3,120,805	302,818	349,543	85,635	1,133,515	67,440	1,941,364	1,188,441	120,800	1,067,641	411,611
Chicago & Northwestern.....	8,108	25,662,977	9,640,000	39,246,305	5,393,238	6,248,974	557,971	12,831,716	755,095	26,005,531	13,213,772	1,925,000	11,307,433	1,669,503

FIVE MONTHS OF FISCAL YEAR 1916

Passenger Train Wrecked by Snow Slide on the Great Northern

The two rear cars, the dining car and a day coach on a Great Northern passenger train were swept from the track into a ravine some 300 ft. deep near Corea, Wash., on the west slope of the Cascade mountains, on January 22, by a snow slide. The dining car caught fire and was destroyed and the day coach was crushed beneath a pile of snow and boulders. According to the first reports, four bodies were recovered from the wrecked cars and 15 passengers were injured, but the number of persons killed had not been definitely ascertained. A sleeping car was turned over on its side, but was not carried down the ravine. The accident occurred on a horseshoe curve near the summit of the mountains at a point where the Great Northern had made very large expenditures for snow sheds during the last three years. During the summer of 1913 alone, 14,594 lineal feet of timber and combination concrete and timber snow sheds were built on this section of the main line between Scenic and Tye, Wash., on the west slope of the mountains, at an expenditure of \$1,500,000, within a distance of about nine miles, where approximately 14,000 ft. of snow sheds were already in service; and in addition a double-track tunnel 1,200 ft. long was driven at a point where it accomplished a double purpose of bettering the alinement and affording protection from snow. Besides the new work very extensive repairs and improvements were made in existing timber sheds within the same limits. The road has always encountered considerable trouble with snow in this district where the snow falls are unusually heavy and where climatic conditions are conducive to slides.

Efficiency on the New Haven

The New York, New Haven & Hartford, which is handling the heaviest freight business in its history, reports that in the first ten days of January the company loaded locally and received loaded from connections 55,774 freight cars. This compares with 47,381 cars a year ago. Until the heavy storms in December, the road was moving at the rate of 200,000 new loads (cars loaded locally and received loaded from connections) per month, or 20,000 more than in November, 1915.

There were 50,401 freight cars on the New York, New Haven & Hartford and the Central New England roads on January 15, 1916. This compares with 41,300 cars on the same date in 1915 and 32,995 cars on the same date in 1914. The capacity of the system is estimated by the officers at 45,000 cars. Anything over that number overtaxes the facilities, retards quick delivery and threatens congestion. On January 15, 1916, there were 12,739 cars on the two roads awaiting unloading, and 3,407 cars awaiting loading; total, 16,146, or 32 per cent of all cars on the system.

The number of cars in bad order on January 15 was only 1,106, or 2.2 per cent of cars on road. The usual average percentage on railroads is from 4 to 6, and at times as high as 7. On January 1 there were only 42 locomotives assigned to the shops for heavy repairs within the following thirty days, and 828 steam locomotives, or 71 per cent, were considered good for three months' service or more. The shops at Readville, New Haven and Roxbury repaired 65 locomotives in December and less than 4 per cent of the company's locomotives were in need of repairs on the first of the year.

A. R. E. A. Nominations

The nominating committee of the American Railway Engineering Association has submitted its nominees for officers for the next year, as follows: President, A. S. Baldwin, chief engineer, Illinois Central; second vice-president, C. A. Morse, chief engineer, Chicago, Rock Island & Pacific, Chicago; treasurer, G. H. Bremner, assistant district engineer, Interstate Commerce Commission, Chicago; secretary, E. H. Fritch. J. G. Sullivan, chief engineer, Canadian Pacific, now second vice-president, automatically becomes first vice-president. Nine nominees were recommended for the three vacancies among the directors, as follows: R. N. Begien, general superintendent, Baltimore & Ohio Southwestern, Cincinnati; W. M. Dawley, assistant engineer, Erie, New York; L. A. Downs, general superintendent Illinois Central, New Orleans; John V. Hanna, chief engineer, Kansas City Terminal, Kansas City, Mo.; A. J. Himes, engineer grade separation, N. Y., C. & St. L., Cleveland; C. E. Lindsey, division engineer, New York Central, Albany, N. Y.; W. D. Pence, member engineering

board, Interstate Commerce Commission, Chicago; F. E. Turneure, dean College of Engineering, University of Wisconsin, Madison, Wis., and J. E. Willoughby, chief engineer, Atlantic Coast Line, Wilmington, N. C.

Ten names were submitted from which five are to be selected as members of the nominating committee for next year: A. M. Burt, chief engineer Maintenance of Way, Northern Pacific, St. Paul; A. F. Dorley, assistant chief engineer, Missouri Pacific, St. Louis; W. K. Hatt, professor of engineering, Purdue University, Lafayette, Ind.; V. K. Hendricks, assistant chief engineer, St. Louis & San Francisco, St. Louis, Mo.; M. A. Long, assistant chief engineer, Baltimore & Ohio, Baltimore; A. Montzheimer, chief engineer, Elgin, Joliet & Eastern, Joliet, Ill.; A. R. Raymer, assistant chief engineer, Pittsburgh & Lake Erie, Pittsburgh; O. E. Selby, principal assistant engineer, Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati; A. F. Robinson, bridge engineer, Atchison, Topeka & Santa Fe, Chicago, and E. B. Temple, assistant chief engineer, Pennsylvania, Philadelphia.

Conference on Railway "Preparedness"

At a conference held at the War Department in Washington last week, Friday, between officers of the government and representatives of a number of the principal railroads of the country, plans were considered looking to efficient operation in case the government should have to mobilize troops on short notice in time of war. The railroads were represented by a committee of which the chairman is Fairfax Harrison, president of the Southern Railway.

The problems to be worked out are outlined as follows:

1. Devising of a special military rate tariff to be availed of by the military forces of the country for the transportation of troops and supplies in time of war and under which the shipment and billing of supplies and settlement of accounts could be handled with the greatest ease and despatch.

2. The enrolment of railroad officers as reserve officers of the quartermaster's department, provided Congress enacts legislation to create a reserve; these officers to be subject to the call of the government in time of war and to be given full commissions.

3. Co-operation between the War Department and the railroads on the solving of problems of engineering construction of military railroads in time of war.

4. Exchanging of information between the railroads and the department from time to time as to the facilities of the carriers and the needs of the government respecting railroad equipment in time of war emergency.

5. A system under which the department in time of war might lose no time in requisitioning such equipment as it may need and under which the railroads might co-operate in the most rapid transportation of troops from place to place.

The Secretary of War is to call a joint conference of the committee and the General Staff of the army in the near future when a comprehensive list of suggestions will be submitted by the army experts for consideration.

In the formulation of the foregoing outline, the railways were represented by the following sub-committee: E. L. Bevington, Transcontinental Passenger Association; C. L. Hunter, Trunk Line Association; F. C. Donald, Central Passenger Association; E. E. McLeod, Western Passenger Association; and J. E. Hannigan, Southwestern Passenger Association.

Floods in Southern California

Railroad service throughout Southern California was seriously interrupted, with a consequent effect on transcontinental traffic, and a great deal of property damage was experienced, as a result of floods caused by the second greatest January rainfall ever recorded in that section, amounting to 11 inches on January 15, 16 and 17. This was in addition to considerable snow in the mountains, which caused all streams in the vicinity of Los Angeles to overflow their banks, washing out the railroad tracks in many places; although the property damage was less than that caused by the flood of 1914. On January 17 all railroad lines entering Los Angeles were out of service. The Southern Pacific Colton line was restored on January 19; the Atchison, Topeka & Santa Fe Fullerton line on January 21, and the San Pedro, Los Angeles & Salt Lake line on January 22. The Atchison, Topeka & Santa Fe main line was also cut at Barstow, Cal., and at Winslow, Ariz., and the Southern Pacific and Sunset-Central

lines were put out of commission by high water in the Gila river at Yuma, Ariz., caused by unprecedented rains in northern and central Arizona, together with a similar condition in the Colorado river north of Yuma. Several transcontinental trains which were started from California during the floods did not reach Chicago until January 21 and 22.

The entire Los Angeles division of the Santa Fe was affected by the flood, which resulted in breaks in the line at about 20 places. The first washout was near San Bernardino on January 17, which put the line into Los Angeles out of commission, and the Riverside line was out of service for two days. After this line was restored it was used by the Southern Pacific trains into Los Angeles. The Santa Fe main line at Barstow was cut on the 18th by the loss of eight bents in the Mojave river bridge at that point, but the line was repaired and restored to service by January 20. The line into Los Angeles via Pasadena was still out of service the early part of this week as the result of a washout at the San Gabriel river crossing, but was expected to be restored during the week. The break at Winslow was caused by high water in the Little Colorado river on January 20. The Southern Pacific line from Ogden via Sacramento was out of commission 30 hours.

The Pacific Electric Railway suffered damage estimated at \$150,000, and its Santa Ana and Huntington Beach lines were still out of service the early part of this week.

The heavy rain came after the ground had been thoroughly saturated by previous rain and snow. After the flood two years ago the Los Angeles County Board of Supervisors appointed a flood control commission of engineers, who recommended an expenditure of \$16,500,000. The plans provided for impounding reservoirs in the mountains, spreading the water into gravel cones which should cause the water to sink into gravel and flow to the sea by subterranean passages. The government was also to build a diversion dam and run-off channels to divert the flood water from Los Angeles harbor to Alamitos bay. The railways had deferred the installation of permanent bridges and structures awaiting the conclusion of the work of the commission, as the rivers shift their channels at each flood and spread over the flat bottoms, leaving bridges high and dry, and making it necessary to build others. The Santa Ana river was not included in the flood control scheme in Los Angeles county because it lies entirely in Orange county; but this year this river has caused the most damage.

North of Yuma, Ariz., the levee extending eastward, which was built for the protection of the town, was overflowed and the entire town was flooded, the streets of the business section being covered with water from 3 ft. to 6 ft. deep. The reclamation levee on the California side of the Colorado river at the junction with the Gila river was broken, causing the river to spread over the flats; and it attacked the Southern Pacific embankment, which is from 20 ft. to 30 ft. high, for a distance of five miles. Breaks were made at six different places, from 300 ft. to 1,200 ft. wide, and traffic was interrupted for 72 hours. South of Yuma, at the scene of the Colorado river break in 1906, which was subsequently repaired by the Southern Pacific, at the request of President Roosevelt, the levee was broken in a number of places. It is estimated that the Colorado river at Yuma carried from 150,000 ft. to 160,000 ft. of water per second, the largest volume of flow since the records for the river have been maintained. The Southern Pacific gave all possible aid to avert disaster.

Senator Lea and the Pass Question

The Nashville, Chattanooga & St. Louis has filed with the Interstate Commerce Commission an answer to charges made by Senator Luke Lea, of Tennessee, alleging illegal issuance of passes by this road and the Louisville & Nashville. The answer denies that the road has issued free passes for the purpose of corruption or bribery, or that it has violated either the laws of the United States or of the state of Tennessee in the issuance of such free transportation, and charges that the petition of Senator Lea was "not filed with a view of subserving the public good, but from malicious and improper motives." At the same time the answer of the L. & N. was filed with the commission.

The petition filed with the commission some time ago by Senator Lea attacked the legality of the issuance of passes in Tennessee by the two roads, and charged that such issuance of passes was for the purpose of corruption and bribery, and also that it was a burden upon interstate commerce. A similar

petition was also filed by the senator with the state railroad commission.

The answer of the roads also refers to the recent senatorial primary and the attempt of the petitioner to make a railroad issue in that campaign; of his utter failure to make such an issue, and of his repudiation by the people at the polls. In referring to repeated attacks made through the columns of the senator's paper directed against the two roads, the answer characterizes them as "false statements intended to arouse the prejudice of the people against respondent and in favor of petitioner."

The answer also reproduces letters showing that from December, 1910, to January 1, 1914, the paper owned and published by Senator Lea, the "Tennessean American" "requested" free transportation and that such transportation was furnished to it just as it was to other newspapers over the state, daily and weekly. One letter, which is a request for a book of fifty-trip passes, bears date of December 9, 1913, 30 days after Senator Lea's resolution was passed in the Senate. These letters are given, the answer says, to show that in the issuance of free passes all papers were treated alike, notwithstanding their editorial attitude, and that certainly no effort was made to "corrupt" the paper of petitioner or to influence it in any way.

The answer admits the issuance of free passes to farmers and educators, to preachers and to representatives of various charitable institutions. It maintains that through co-operation with the Department of Agriculture, Department of Education, etc., much good has been accomplished by enabling the farmers to gather in institute meetings and by making possible the gathering of the public school teachers in educational meetings. The answer also says it has given passes to newspapers, particularly the country press, "to encourage such newspaper enterprise."

The answer also refers to the fact that for 20 years the railroads have given free transportation to the governors and other public officers of the state who requested it, and that it remained for Senator Lea to charge that they were corrupted by such free transportation.

The answer denies that free passes have been issued to prominent interstate shippers in order to influence their shipments, and also denies that the issuance of intrastate passes has become a burden on interstate commerce.

The answer also says that respondent is advised that the issuance of intrastate passes is something over which the Interstate Commerce Commission has no control; that it is a matter wholly without its jurisdiction, and that the state railroad commission knows and has known the practices of the various railroads in the state, and furthermore, that the section of the Tennessean referred to by Senator Lea as covering the issuance of passes is not interpreted by either the Interstate Commerce Commission or the state railroad commission the same as petitioner Lea interprets it—and that section of the law is quoted in the answer, showing that where the petitioner seeks relief, that part of the law is not used as in the act to regulate commerce; in other words, that where the Hepburn act speaks about property, persons, etc., the Tennessee law omits "persons."

The answer also says that the giving of passes by public service corporations is different from the giving of patronage by politicians, for in the former case the road gives something that belongs to it, while in the case of the politician he may, on occasion, give something which belongs to the people of the state or the United States.

Railway Earnings and Expenses for November

Net operating income of the railways of the United States for November, 1915, according to the monthly bulletin of the Bureau of Railway Economics, increased \$207 per mile, or 84.9 per cent, as compared with November, 1914. This comparison, however, is between the highest and the lowest November in six years. A comparison of November 1915, with the average November of the preceding five years shows an increase of 45.8 per cent.

Total operating revenues amounted to \$298,274,613, an increase over 1914 of \$64,510,337. Operating expenses were \$183,092,447, an increase of \$15,984,949. Net operating revenue amounted to \$115,182,166, an increase of \$48,525,388. Taxes amounted to \$12,133,251, an increase of \$933,878. This left \$102,988,770 net operating income, available for rentals, interest on bonds, appropriations for improvements and new construction, and dividends. Operating revenues per mile averaged \$1,303, an increase of

REVENUES AND EXPENSES OF STEAM ROADS—NOVEMBER, 1915

ACCOUNT	Compiled from monthly returns of the railways to the Interstate Commerce Commission and covering roads of Class I, i.e., roads with annual operating revenues above \$1,000,000									
	UNITED STATES					EASTERN DISTRICT				
	Per mile of line					Per mile of line				
	Amount, November, 1915	1915	1914	per cent	Increase over 1914	Amount, November, 1915	1915	1914	per cent	Increase over 1914
Total Operating Revenues.....	\$298,274,613	\$1,303	\$1,026	27.0	27.0	\$131,286,315	\$2,228	\$1,715	29.9	29.9
Breight	219,030,319	957	717	33.5	33.5	96,015,432	1,630	1,176	38.6	38.6
Passenger	53,644,484	22	21	10.3	10.3	22,676,629	385	359	7.2	7.2
Mail	4,988,876	22	21	4.9	4.9	1,831,749	31	29	5.7	5.7
Express	6,389,058	28	25	9.4	9.4	2,959,708	50	46	9.9	9.9
All other	14,221,876	62	50	23.0	23.0	7,802,797	132	105	26.1	26.1
Total Operating Expenses	183,092,447	800	734	9.0	9.0	83,916,838	1,424	1,305	9.1	9.1
Maint. of way and struct.....	32,536,002	142	127	12.1	12.1	13,854,478	235	211	11.1	11.1
Maint. of equipment.....	45,721,072	200	178	12.3	12.3	21,553,627	366	329	11.1	11.1
Traffic	5,008,864	22	22	1.2	1.2	1,832,752	31	33	d 4.8	d 4.8
Transportation	91,755,044	401	375	1.2	1.2	42,973,412	730	675	8.1	8.1
General	6,531,758	28	27	6.7	6.7	2,840,605	48	43	11.5	11.5
All other	1,539,707	7	5	34.2	34.2	861,964	14	14	9.8	9.8
Net Operating Revenue.....	115,182,166	503	292	72.0	72.0	47,369,477	804	410	96.0	96.0
Taxes	12,133,251	53	49	7.8	7.8	4,650,691	79	80	d 1.5	d 1.5
Uncollectible Revenues.....	60,145	*	*	....	....	16,664	*	*	....	....
Railway Operating Income.....	102,988,770	450	243	84.9	84.9	42,702,122	725	330	119.7	119.7
Operating Ratio—Per cent.....	{ 1915	61.4	63.9			12,662,344	301	165	82.0	82.0
	{ 1914	71.5	74.5				65.4			
Average mileage represented.....	{ 1915	228.885	58,902				74.5			
	{ 1914	227.779	58,851				42,103			
			41,994							

* Less than one dollar. d Decrease.

27 per cent; operating expenses averaged \$800, an increase of 9 per cent; net operating revenue per mile averaged \$503, an increase of 72 per cent, while net operating income per mile was \$450, an increase of 84.9 per cent. Taxes per mile increased 7.8 per cent. Railways operating 228,885 miles of line are covered by this summary, or about 90 per cent of the steam railway mileage in the United States.

Both the total operating revenues and the net operating revenues per mile for November, 1915, were greater than for any other November in the history of the roads. Total operating revenues were \$66 a mile greater than in November, 1912, but were less than for October, 1912, when the average was \$1,338. Net operating revenues were \$95 a mile greater than in November, 1912, but were less than for October, 1915, when the average was \$508. Operating expenses per mile were \$29 less than in November, 1912.

Operating revenues of the Eastern railways per mile show an increase of 29.9 per cent as compared with November, 1914; operating expenses increased 9.1 per cent, net operating revenue increased 96 per cent, and taxes decreased 1.5 per cent. Operating income increased 119.7 per cent. This, also, compares the highest and the lowest November in six years. Comparing November, 1915, with the average Novembers for five years past, the increase was 67.6 per cent.

Operating revenues of the Southern railways per mile increased 24.6 per cent, operating expenses increased 9.4 per cent, net operating revenue increased 69.1 per cent; taxes increased 10.1 per cent; operating income increased 82.0 per cent. Here, again, the comparison is between the highest and the lowest November in six years. Comparing November, 1915, with the average for five years past, the increase was 28.9 per cent.

Operating revenues of the Western railways per mile show an increase of 25.1 per cent, operating expenses increased 9.1 per cent, net operating revenue increased 55.9 per cent, taxes increased 16.1 per cent, and operating income increased 62.6 per cent. Here, as above, the comparison is between the highest and the lowest November in six years. Compared with the average for five years past, November, 1915, operating income increased 35.4 per cent.

The five months of the current fiscal year, compared with the corresponding period of the preceding year, show changes per mile of line as follows: Operating revenues increased 9.1 per cent, operating expenses increased 0.7 per cent, net operating revenue increased 27.1 per cent, taxes increased 3.4 per cent and operating income increased 30.9 per cent.

Operating income per mile increased 42.9 per cent in the East, increased 41.8 per cent in the South, and increased 18.5 per cent in the West.

November operating income per mile was 84.9 per cent greater in 1915 than in 1914, 57.4 per cent greater than in 1913, 24 per cent greater than in 1912, and 43.8 per cent greater than in 1911.

The Railway Development of Africa

Sir Charles Metcalfe, lecturing before the Royal Geographical Society (London) on December 1, stated some interesting opinions relative to the probable future development of the railways of Africa. So far, in many places, rivers have been used as the main arteries of traffic, and railways have been built to work in conjunction with them. Naturally, as trade increases, the railways will be made continuous, the rivers being still used as feeders. This network of veins of railways, which are steadily being pushed forward into the center of Africa, must inevitably connect, in the future, with great arteries going north and south through the continent. They will be great channels of trade, passing through vast territories capable of enormous development, and occupied by millions of people.—*Railway Gazette, London.*

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the *Railway Age Gazette* for each month.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1916, Atlanta, Ga.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Mid-year meeting, February 4, 1916, Congress Hotel, Chicago.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConaughy, 165 Broadway, New York.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 21-23, 1916, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 18-20, 1916, Chicago.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual session, May 17, 1916, Washington, D. C.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, C. & E. I., 922 McCormick Bldg., Chicago. Annual meeting, May, 1916, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, July, 1916.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next meeting, August, 1916, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 23-26, 1916, Hotel Hollenden, Cleveland, Ohio.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March 21-23, 1916, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May, Assembly Rooms of Merchants' Association, Woolworth Bldg., New York.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, January 27, 1916, Waldorf-Astoria Hotel, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J. Regular meetings, 1st Monday in month, except July and August, The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 192 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor 1112 Karpen Building, Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

Traffic News

The Santa Fe and the Texas & Pacific are carrying large quantities of hay out of western Texas and eastern New Mexico. More than 1,200 carloads have been bought in the Pecos River Valley by agents of the French and English governments, and the hay is being rapidly moved to Galveston for shipment to France. At Galveston three bales are compressed into one bale.

The Department of Agriculture announces that a "wool demonstration car" is being run throughout the sheep-raising districts of Montana, Idaho, Wyoming and Utah. Lecturers traveling in this car educate farmers and dealers in grading wool and in other matters designed to aid them in producing higher qualities and in securing better prices for their product. Six live sheep are carried in the car and are used to show the value of discrimination in breeds and in care of animals and wool.

At a meeting of representatives of the commercial bodies of several of the larger cities of Texas and many individual shippers which was held at Austin January 20, an organization to be known as the Shippers and Consumers' Traffic Association was formed. It is proposed to try to have the State Railroad Commission empowered to make interstate rates and to oppose the alleged encroachment of the Interstate Commerce Commission upon what are claimed to be State rights, in connection with the Shreveport rate case. The promoters of the new association believe that "the very existence of the State Railroad Commission is at stake," and they have asked the Governor of the State to endorse their appeal for money for legal expenses.

Wisconsin Commercial and Industrial Congress

One session of the Wisconsin Commercial and Industrial Congress, to be held at the University of Wisconsin at Madison on February 14 to 18, that on Wednesday, February 16, is to be devoted to traffic problems and foreign trade, under the chairmanship of Halford Erickson, of the Wisconsin Railroad Commission. Papers will be presented as follows: "The Rate Question in Wisconsin," by J. N. Tittmore, of Omro, Wis.; "The Railroad Commission and the Shipper," by Carl D. Jackson, of the Wisconsin Railroad Commission, and "Some Contemporary Aspects of Foreign Trade," by Prof. Ralph H. Hess. The afternoon session on the same day will be devoted to the subject "Government Regulation of Business" under the chairmanship of Prof. Richard T. Ely. Papers will be presented on "The Work of the Federal Trade Commission," by Joseph E. Davies, chairman of the Federal Trade Commission, and "The Service of Railways and the Functions of Government in Relation Thereto," by Samuel O. Dunn, editor of the *Railway Age Gazette*.

RUSSIA'S NEW RAILWAYS.—The existing railway from Petrograd to Archangel, which is a single-track line, is a very valuable artery, but its utility is qualified by the fact that Archangel is unable to handle traffic during several months of each year, owing to the freezing over of the White Sea. About 10 years ago, Ekaterina, some 300 miles to the northwest of Archangel, was suggested as an ideal terminus for a new railway. Although north of Archangel, and almost within the Arctic circle, Ekaterina is ice-free all the year round, owing to its being within the influence of the gulf stream, while the waters of the harbor are also calm when the north Arctic storms are prevailing. Archangel is at the moment Russia's principal port for the delivery of munitions from abroad, and as the single-track line has been unable to handle the present enormous munition traffic expeditiously enough, while it was realized that even the most powerful ice-breakers could not be relied on to keep the White Sea open all the winter, the Russian government decided on the construction of the Petrograd-Ekaterina line. Construction is proceeding simultaneously from both ends. As the work is recognized to be one of military necessity, it is being pressed forward with all speed, and there has been no labor shortage. It is understood that the Russian government has also been considering double-tracking the Archangel line.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Manufacturers of agricultural implements in the Middle West have filed a petition with the Interstate Commerce Commission asking for a rehearing of that part of the supplemental western rate advance case in which the commission allowed increases in the rates on agricultural implements.

The Interstate Commerce Commission at a hearing in Chicago on January 24, before Examiner Settle, resumed its investigation of the relation between railroads and private car lines, which was interrupted several months ago by the refusal of F. W. Ellis, vice-president of the Armour Car Lines, to testify regarding the relations between the car lines and Armour & Company and the railroads. George B. Robbins, head of the transportation department of Armour & Company, testified that the operation of the company's meat refrigerator cars had been turned over to Armour & Company, while the fruit and vegetable refrigerator cars were being operated by the Fruit Growers' Express, a subsidiary company. Mr. Robbins was examined at length regarding the history and operations of the car lines controlled by Armour & Company. It was announced that opportunity would also be given to those who had testified at the previous hearings to bring their information up to date.

Ferromanganese to Western Points

Opinion by the Commission:

The commission finds that the carriers have justified a proposed withdrawal of import rates on ferromanganese from eastern ports to central freight association territory. (37 I. C. C., 374.)

Fabrication in Transit at Greenville, Pa.

Opinion by the Commission:

The commission finds that the Erie has justified a proposed restriction of fabrication-in-transit service at Rochester, Ind., and Greenville, Pa., to iron and steel articles intended for framework or sections for bridges or buildings. (37 I. C. C., 370.)

Coal from Colorado and Wyoming Mines

Opinion by Commissioner Clements:

The commission finds that the Union Pacific has not justified proposed increased rates on bituminous lump coal in carloads from mines in Colorado and Wyoming to destinations on its lines in Nebraska and Colorado. (37 I. C. C., 430.)

Increased Rates Found Justified

Stone to Des Moines, Ia. Opinion by the Commission:

Proposed increased rates on stone of all kinds, rough or dressed, not lettered or figured, from the twin cities to Des Moines, Ia., are found to have been justified for rough stone, but not for dressed stone. (37 I. C. C., 372.)

Reparation Awarded

Milliken Refining Company v. Missouri, Kansas & Texas. Opinion by Commissioner Harlan:

A rate of 29 cents per 100 lb. on refined petroleum and its products in carloads from Vinita, Okla., to Windsor, Mo., is found to have been unreasonable to the extent that it exceeded 17 cents. (37 I. C. C., 295.)

Iron and Steel Articles in Southern Territory

American Steel & Wire Company v. Alabama & Vicksburg et al. Opinion by Commissioner Clements:

The item of the southern classification effective April 20, 1914, here complained of, having been cancelled since the hearing, the complaint is dismissed. The commission suggests, however, that the carriers in southern territory should revise their classification descriptions on certain iron and steel articles, making them more definite. (37 I. C. C., 525.)

Westbound Transcontinental Rates on Buckwheat and Corn Flour

Opinion by the Commission:

The commission in a report rendered November 9, 1914, found that the rates on buckwheat flour and corn flour from producing points in transcontinental groups A to J, inclusive, to California terminals and intermediate points might be a differential of 10 cents a 100 lb. higher than the rates on wheat flour. Upon a rehearing it is found that no higher rates should be maintained on buckwheat flour or corn flour in carloads than on wheat flour in carloads. (37 I. C. C., 364.)

Rates on Burlap from New Orleans to Dallas

New Orleans Joint Traffic Bureau v. Abilene & Southern et al.

Opinion by Commissioner Clements:

A difference of 13 cents per 100 lb. between the import rate on burlap in carloads and the domestic rate on burlap bags in carloads from New Orleans, La., to Dallas, Tex., is found unduly prejudiced to shippers of the latter commodity and a maximum difference of 5 cents is prescribed. The record in the case is held insufficient to justify a finding as to the reasonableness of the present rates on burlap bags in carloads and in less than carloads from New Orleans to Dallas. (37 I. C. C., 444.)

Grain from Manitowoc, Wis.

Opinion by the Commission:

The commission finds that the Pere Marquette and the Ann Arbor have not justified proposed increased reshipping rates on grain and grain products and proposed increased charges under the reshipping rates on grain to be effected by the withdrawal of transit service, the imposition of a switching charge, and an increase in the minimum weights, from Manitowoc and Milwaukee, Wis., Chicago and other points, to central freight association and trunk line territories, the Virginia cities, and other points, on shipments routed via these railroads and connections. (37 I. C. C., 549.)

STATE COMMISSIONS

The California Railroad Commission has dropped its investigation of the rates, service and labor conditions of the Pullman Company in California, on which it has held several hearings and issued one report. It is said that the company has complied in part with the commission's views by increasing the wages of porters and conductors.

COURT NEWS

On the application of former Congressman M. E. Rhodes, the Circuit Court of Cole county, Mo., has issued an order directing the Missouri Public Service Commission to show cause by February 7 why its recent order allowing general advances in intrastate rates in Missouri should not be set aside. Mr. Rhodes had previously asked the commission to set aside its order, contending that it was without authority to allow increases in rates.

Interference with Construction of Line

The New Jersey Court of Errors and Appeals holds that where a corporation, organized under the general railroad act, filed its survey and location, and obtained the approval of the public utility commissioners as to its project, the fact that it failed to obtain the consent of the local governing body of the township wherein one of its termini was located, will not warrant the latter body in interfering with the laying of the tracks, within the prescribed route, and an injunction will issue to prevent such interference.—*Elizabeth & Trenton v. Woodbridge Township* (N. J.), 95 Atl. 987.

Deaf Trespasser on Track

A person walking on a railroad track where pedestrians have no right to the use of the track, is a trespasser; and, if he is deaf, he is required to use extraordinary care and exercise his sense of sight to learn of the approach of trains. Where a person totally deaf was killed by a train, the Nebraska Supreme Court holds that if he fails to use his remaining senses and is struck by a train, he is guilty of contributory negligence. Unless the engineer carelessly ran him down, the company is not liable.

The engineer used all proper signals to warn the man of the approach of the train up to the moment when it appeared that he was not going to step off the track, and then did everything possible to stop the train and avoid hitting him. It could not therefore be said that the engineer carelessly ran the man down. For these reasons a judgment awarding \$15,000 for the death was reversed and the case dismissed.—*Hooker v. Wabash* (Neb.), 154 N. W., 855.

Track Accident to Civil Engineer

A civil engineer for a railroad was walking along the main track, checking up his survey for a side track. He stepped on a cross-tie from which a small decayed piece 1½ inches by 6 inches, V-shaped, shivered off under his weight. His foot slipped down between the ties into a space about 5 or 6 inches deep from the top of the tie to the ballast. He stumbled, fell, and dislocated his knee-cap. In a suit against the company he admitted that he could have done his work as well walking outside of the track. As only reasonable care and diligence are required of a master as to providing a safe place to work, the North Carolina Supreme Court held that the railroad was not liable. To require of a railroad company to discover every little "doty place" in every one of its thousands of cross-ties in order that its employees of every class may walk with absolute safety on them would demand of it a degree of care and diligence almost beyond human endeavor.—*Nelson v. Southern* (N. C.) 86 S. E. 1036.

Transportation of Alcohol

The South Carolina statute of 1915 prohibits the sale, purchase, or transportation of intoxicating liquors within the state, whether in interstate shipment or not. Section 8 excepts the sale or transportation of alcohol under the Criminal Code of 1912, sections 799, 800, 802 to 812 inclusive. These sections relate mainly to sales by retail druggists for use in the arts and for scientific and mechanical purposes. Section 795, not referred to in the 1915 statute, provides for the sale of alcohol by wholesale druggists to certain consumers for certain purposes, and prescribes the manner and conditions of such sales. The South Carolina Supreme Court holds that, although section 795 was not expressly excepted from the statute of 1915, that statute would not interfere with the right of wholesale druggists to handle alcohol under, and in accordance with the existing law, and a common carrier would not be prohibited from delivering a shipment of grain alcohol to a wholesale druggist to be used for lawful purposes.—*E. M. Matthews Co. v. A. C. L.* (S. C.) 86 S. E. 1068.

Damages Excessive; Reduced from \$8,750 to \$2,000

In an action against a railroad for personal injuries the plaintiff received a verdict of \$8,750. The defendant's liability was admitted. On appeal, the Maine Supreme Court holds that the verdict was unconscionably excessive. "This case," the court said, "presents a typical illustration of the extremes to which reputable physicians will sometimes go in testifying in behalf of a patient, and the boundless latitude over which pathology, diagnosis and prognosis will permit them to range. To give an intelligible analysis of the evidence in this case would require a space beyond the confines of any ordinary opinion, and serve no useful purpose. Seventeen questions were submitted to the jury, which, with the subdivisions, required just thirty answers. The questions were all couched in medical language, and many of them were of a highly technical nature. To illustrate: Question 9. Did plaintiff receive an injury to pelvic floor caused by defendant's negligence? Question 16. Is the plaintiff's condition caused by the defendant's negligence such that an operation, to wit, hysterectomy, will have to be performed? Question 17a. Is she suffering from general traumatic neurasthenia and inertia of nerves controlling the blood supply of the uterus? Twenty-seven of the answers were in the affirmative. To sixteen the jury, to their credit, said, 'Do not know.' . . . The jury were overwhelmed with this array of medical inquiries and technical terms. An exaggerated verdict might well be expected. It is the opinion of the court that \$2,000 is ample compensation for all the injuries inflicted upon the plaintiff by the admitted negligence of the defendant."—*Wingate v. Waterville, F. & O.* (Me.), 95 Atl. 882.

Railway Officers

Executive, Financial, Legal and Accounting

A. D. Parker, vice-president of the Colorado & Southern at Denver, Colo., has resigned, effective March 1.

E. R. Dickenson has been appointed auditor of disbursements for the Denver & Rio Grande, in place of J. F. Morris, resigned.

L. W. Newcomb, assistant real estate and tax agent and industrial agent of the Central of New Jersey, at New York, has been appointed real estate and tax agent, vice James H. Moore, retired. G. B. Littell has been appointed assistant real estate and tax agent, and will also perform the duties of industrial agent.

William Ainsworth Parker, who has been appointed a general attorney of the Baltimore & Ohio, was born on October 1, 1874, at Albany, N. Y. He was educated at St. Paul's School, Concord, N. H., and later attended Harvard University Law School, from which he graduated in 1905. After practising law in New York City he was appointed assistant to the general attorney of the Baltimore & Ohio in September, 1906. In January, 1909, he became an assistant general attorney, remaining in that position until his recent appointment as a general attorney of the same road, as above noted.

A. Hunter Boyd, Jr., who has been appointed a general attorney of the Baltimore & Ohio, as has already been announced in these columns, was born on May 16, 1878, at Cumberland, Md. He was educated at Allegheny County Academy, and later graduated from Princeton University, and in 1902 from the Law School of the University of Maryland. Mr. Boyd was appointed counsel of the Baltimore & Ohio on February 1, 1907, and became an assistant general attorney in February, 1912, which position he held until his recent appointment as a general attorney of the same road. In October, 1911, when the Baltimore & Ohio created a department of safety, Mr. Boyd was appointed chairman of the general safety committee.

Robert Marsden Smith, whose appointment as a general attorney of the Baltimore & Ohio has already been announced in these columns, was born on February 9, 1878, at Baltimore, Md. He graduated from Johns Hopkins University with the degree of A. B., and later from the University of Maryland Law School with the degree of LL. B. In 1901 he took a special course in the Law School of Harvard University. Mr. Smith also studied law in the legal department of the Baltimore & Ohio Railroad during his course at the University of Maryland. On April 2, 1906, he was appointed assistant general solicitor of the Baltimore & Ohio, which position he held at the time of his recent appointment as a general attorney of the same road, as above noted.

Arthur A. Tisdale, whose appointment as assistant to the vice-president and general manager and purchasing agent of the Grand Trunk Pacific, has been announced, was born on March 8, 1874, near Brantford, Ont. He received a public and commercial school education. On September 18, 1889, he entered the service of the Grand Trunk at Hamilton, Ont. After three years in the local freight office at that city, he became secretary to the chief engineer, remaining in that position for seven years, both at Hamilton and Montreal. He then served as secretary to the general superintendent at Montreal for three years, following which he spent five years as chief clerk to the manager and chief clerk to the assistant fourth vice-president of the same railway. After two years as assistant to the vice-president and general manager of the Grand Trunk Pacific, he became in October, 1909, division superintendent at Ft. William, Ont., where he remained until May, 1915. His last position previous to his recent promotion was that of division superintendent at Regina, Sask.

Operating

The authority of H. McCall, superintendent of the Grand Trunk Pacific at Melville, Sask., has been extended to include the Regina division, vice A. A. Tisdale, promoted.

F. A. Bevington has been appointed assistant trainmaster of

the St. Louis division, east, for the Cleveland, Cincinnati, Chicago & St. Louis, with office at Terre Haute, Ind., vice H. Goodwin, promoted.

Theodore Speiden, Jr., superintendent of the Chattanooga division of the Nashville, Chattanooga & St. Louis, at Nashville, Tenn., has had his authority extended over the Nashville division. Gordon D. Hicks, superintendent of the Nashville division, at Nashville, has been appointed superintendent of the Huntsville division with headquarters at Tullahoma, Tenn., succeeding W. G. Templeton, who has been appointed assistant superintendent of the Nashville and Chattanooga divisions, at Nashville. Effective February 1.

Carl Scholz has been appointed manager of the mining and fuel department of the Chicago, Rock Island & Pacific. D. B. Sebastian, formerly fuel agent, has been appointed assistant manager in charge of fuel, and H. S. Mikesell has been appointed assistant manager in charge of mines. H. Clewer, formerly superintendent of locomotive operation, has been appointed superintendent of fuel economy, reporting to D. B. Sebastian. They will have headquarters at Chicago. For an outline of the department organization, see items under General News.

J. W. Riley, superintendent of the Pittsburgh & Lake Erie at Pittsburgh, Pa., has been appointed general superintendent, assuming the duties formerly performed as superintendent; N. K. Hoffman, superintendent of car service at Pittsburgh, has been appointed superintendent of freight transportation, and the office of superintendent of car service has been abolished; A. D. Brown has been appointed assistant to general manager and J. B. Yohe, Jr., passenger trainmaster at Pittsburgh, has been appointed assistant superintendent, all with headquarters at Pittsburgh. F. S. Weigel, assistant trainmaster at New Castle Junction has been assigned to passenger service. The office of passenger trainmaster has been abolished.

Fayette R. Rockwell, whose appointment as assistant general manager of Utah lines, Denver & Rio Grande, has been announced, was born at



F. R. Rockwell

at Hornellsville, N. Y., on May 2, 1864. He entered railway service in 1875, as messenger on the Erie; from 1876 to 1879 he was telegraph operator for the same road, and from 1879 to 1883 train despatcher. In 1883 he entered the employ of the Denver & Rio Grande as train despatcher and in 1887 was promoted to chief train despatcher, and later to trainmaster. He was made superintendent of the Florence & Cripple Creek in October, 1899; in May, 1901, he became a division superintendent of the Denver & Rio Grande, leaving the service in November, 1902, to engage in the mercantile business. He returned to the Denver & Rio Grande in November, 1904, as division superintendent at Pueblo, Colo. From June, 1909, to October, 1910, he was out of railway service, but returned in 1910, as general superintendent of Colorado lines, Denver & Rio Grande, with office at Denver, Colo. He continued in this position until his recent promotion to assistant general manager of Utah lines, with office at Salt Lake City.

Traffic

William E. Cullen has been appointed commercial agent of the Chicago Junction, with office at Chicago, Ill.

Julius S. Walsh, Jr., has been appointed industrial agent of the Wabash, with office at St. Louis, Mo.

M. A. Greding, traveling freight agent for the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Little Rock,

Ark., has been promoted to commercial agent, with office at Dallas, Tex.

O. P. Bartlett has been appointed assistant general agent of the Southern Pacific, with office at Chicago, Ill. Effective February 1.

Frank E. Emery was incorrectly reported to have been appointed commercial agent for the Cincinnati, Indianapolis & Western, with office at St. Louis, Mo. Mr. Emery's title is general agent.

F. D. Hammer, district passenger agent of the Wabash at Houston, Tex., has been appointed division passenger agent, with office at St. Louis, Mo., vice H. M. Dressel, resigned to engage in other business. H. P. Gardner, city ticket agent at St. Louis, has been appointed district passenger agent at Houston, to succeed Mr. Hammer.

Herbert Bertermann, appointed assistant general passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, was born



H. Bertermann

on July 9, 1881, at Indianapolis, Ind. He entered railway service on November 15, 1897, in the general office of the Lake Erie & Western, at Indianapolis. On November 1, 1902, he was made traveling passenger agent of the same road with headquarters at Muncie, Ind. He returned to Indianapolis on July 1, 1904, as district passenger agent, and continued in that position until April 1, 1906, when he became traveling passenger agent for the Big Four with headquarters at the same city. On July 1, 1907, he went to Peoria, Ill., as general agent, passenger department, and on November

1, 1911, was transferred in the same capacity to Louisville, Ky. On March 1, 1914, he was appointed general agent for the passenger department, at Columbus, Ohio, and on January 1, 1916, was promoted to assistant general passenger agent with office at Cincinnati, Ohio.

A. G. Little has been appointed general agent for the Sunset-Central lines at Cincinnati, Ohio, vice O. P. Bartlett, promoted. C. T. Collett has been appointed general agent at Kansas City, Mo., vice Mr. Little, promoted. T. H. Pointer has been appointed commercial agent at Oklahoma City, Okla., vice C. T. Collett, promoted. Effective February 1.

T. P. Chambers has been appointed general agent, freight department, of the Atchison, Topeka & Santa Fe Coast Lines, with office at Los Angeles, Cal., to succeed H. H. Francisco, transferred to Portland, Ore. H. E. Vernon has been appointed general agent with office at Honolulu, H. T. H. H. Francisco has been appointed general agent with headquarters at Portland, vice H. E. Vernon.

B. F. Horner, general passenger agent of the New York, Chicago & St. Louis at Cleveland, Ohio, will retire on February 1, and will be succeeded by J. Y. Calahan, now assistant general passenger agent at Chicago. Mr. Calahan will be succeeded by C. A. Asterlin, district passenger agent at Minneapolis, Minn., who will have new title of general western passenger agent. Robert E. Payne has been appointed general eastern passenger agent, with office at Buffalo, N. Y.; C. A. Beck has been appointed district passenger agent at Minneapolis, Minn., vice Mr. Asterlin.

L. L. Hyde, assistant general freight agent of the Lake Erie & Western at Peoria, Ill., has been promoted to general freight agent, with headquarters at Indianapolis, Ind., vice M. R. Maxwell, resigned to accept service with another company. G. H. McHugh, commercial agent at Peoria, has been promoted to division freight agent at the same city, with jurisdiction over the

Peoria division. A. C. McKinley has been appointed commercial agent at Peoria, vice Mr. McHugh, promoted. The office of assistant general freight agent at Peoria has been abolished.

The following appointments have been made in the traffic department of the Denver & Rio Grande in addition to those which have already been mentioned since the recent separation from the Missouri Pacific-St. Louis, Iron Mountain & Southern: R. C. Nichol, general agent, New York City; J. T. Neison, general agent, Pittsburgh, Pa.; J. H. Harper, general agent, Cleveland, Ohio; J. E. Clark, general agent, Cincinnati, Ohio; J. L. Hohl, general agent, St. Louis, Mo.; H. G. Bock, general agent, Omaha, Neb.; E. C. Roxbury, general agent, Kansas City, Mo.; J. E. Woodfin, general agent, Ft. Worth, Tex.; A. E. Brown, general agent, Detroit, Mich.; E. S. Blair, general agent, Los Angeles, Cal.; W. C. McBride, general agent, Portland, Ore.; A. C. Wilson, general agent, Colorado Springs, Colo.; W. B. Kenney, general agent, Grand Junction, Colo.; O. O. Stanchfield, general agent, freight department, Pueblo, Colo.; E. C. Pate, district passenger agent, Boston, Mass.

Engineering and Rolling Stock

Albert Darrow has been appointed signal supervisor on the Buffalo division of the Buffalo, Rochester & Pittsburgh with office at Salamanca, N. Y.

Charles A. Bingaman, assistant engineer of motive power of the Philadelphia & Reading at Reading, Pa., has been appointed mechanical engineer of the Philadelphia & Reading and subsidiary companies. The position of assistant engineer of motive power has been abolished.

Special Officers

Frank S. Coleman, chief clerk to the vice-president and general manager of the Gulf, Colorado & Santa Fe, has been appointed publicity agent, with headquarters at Galveston, Tex.

OBITUARY

Martin A. Barnes, roadmaster of the Northern Pacific at Duluth, Minn., died on January 10.

George W. Barney, district passenger agent of the Chesapeake & Ohio at Lexington, Ky., died on January 21, at his home in Lexington at the age of 71.

A. Shields, who was master mechanic of the Canadian Northern at Winnipeg, Man., previous to 1912, died on January 18, in Rochester, Minn., at the age of 48.

Lucien L. Gilbert, who was assistant counsel of the Pennsylvania Company, at Pittsburgh, Pa., from 1896 to 1914, died on January 20, at his home in Pittsburgh, at the age of 71.

James Means, who resigned from the service of the Pittsburgh, Cincinnati, Chicago & St. Louis as division freight agent at Pittsburgh, Pa., about 13 years ago, died on January 20, at his home at Columbus, Ohio, aged 88.

Edward L. Lomax, passenger traffic manager of the Western Pacific, died at his home in San Francisco, Cal., on January 21, from an affection of the heart. Mr. Lomax was born on February 25, 1852, at Fredericksburg, Va., and was educated at Coleman Institute. He entered the employ of the Burlington & Missouri River in 1869, as a local ticket clerk in Iowa; from January 1, 1872, to April 1, 1874, he was chief clerk in the passenger department of the Central Railroad of Iowa; from April 1, 1874, to August 1, 1879, he was assistant general passenger agent of the St. Louis & Southeastern; and from August 1, 1879, to March, 1881, assistant general passenger agent of the St. Louis, Iron Mountain & Southern. He was appointed general passenger and ticket agent of the Toledo, Cincinnati & St. Louis, in March, 1881, and in August, 1881, entered the service of the Chicago, Burlington & Quincy as chief clerk of the passenger department. In May, 1885, he was promoted to assistant general passenger agent of the same road, and in September, 1887, became assistant general passenger agent of the Union Pacific. From March, 1889, to July 1, 1910, he was general passenger and ticket agent of the same road, and from the latter date up to the time of his death, passenger traffic manager of the Western Pacific. From August 1, 1913, to April 1, 1915, he was also passenger traffic manager of the Denver & Rio Grande.

Equipment and Supplies

LOCOMOTIVES

THE BESSEMER & LAKE ERIE has issued an inquiry for 20 locomotives.

THE SUNSET-CENTRAL LINES will equip 15 locomotives with superheaters.

THE ALEXANDRIA & WESTERN has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE COLUMBIA & NEHALEM RIVER has ordered one Mikado locomotive from the Baldwin Locomotive Works.

THE MARDEZ LUMBER COMPANY has ordered one Mogul type locomotive from the Baldwin Locomotive Works.

THE JONESBORO, LAKE CITY & EASTERN has ordered 2 Mogul type locomotives from the Baldwin Locomotive Works.

THE GENERAL CHEMICAL COMPANY has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE NEW YORK, NEW HAVEN & HARTFORD is reported as contemplating the purchase of a number of Pacific type locomotives.

THE PENNSYLVANIA RAILROAD has authorized its Juniata shops to proceed with the construction of 45 Mikado (L-1-s) type locomotives, 50 six-wheel switching (B-6) locomotives and 10 four-wheel switching (A-5) locomotives. All of these 105 locomotives are for the Lines East of Pittsburgh.

THE QUELIMANE RAILWAY of Portuguese East Africa, has ordered 2 Mogul type locomotives from the American Locomotive Company. One of these engines will have 11 by 16-in. cylinders, 33½ in. driving wheels and a total weight in working order of 38,000 lb. The other will have 13 by 18 in. cylinders, 34½ in. driving wheels and a total weight in working order of 53,000 lb.

FREIGHT CARS

THE KINGAN REFRIGERATOR LINE has issued an inquiry for 100 cars.

THE UNION TANK LINE has ordered 1,000 tank cars from the Standard Steel Car Company.

THE PENNSYLVANIA RAILROAD has ordered 1,000 all-steel box cars for the Lines East of Pittsburgh from its Altoona shops.

THE ERIE is understood to have withdrawn its inquiry for gondola and box cars, mentioned in the *Railway Age Gazette* of January 7.

THE BALTIMORE & OHIO has ordered 2,000 freight cars from the Cambria Steel Company and 1,000 from the American Car & Foundry Company.

THE SOUTHERN PACIFIC has issued inquiries for 500 automobile and 250 gondola cars in addition to the cars mentioned in the *Railway Age Gazette* of January 14.

THE DIAMOND ALKALI COMPANY, reported in last week's issue as being in the market for 10 ore cars, has ordered 10 gondola cars from the Pressed Steel Car Company.

THE BETHLEHEM STEEL CORPORATION, reported in the *Railway Age Gazette* of January 7 as having issued inquiries for 100 gondola cars, has ordered these cars from the Pressed Steel Car Company.

PASSENGER CARS

THE UNITED RAILWAYS OF HAVANA are in the market for 2 motor cars.

THE NASHVILLE, CHATTANOOGA & ST. LOUIS is in the market for 2 postal cars.

THE UNION PACIFIC is understood to be contemplating the purchase of passenger cars.

THE PENNSYLVANIA RAILROAD has authorized its Altoona shops to proceed with the construction of 50 (P-70) coaches,

20 (PB-70), combination passenger and baggage cars and 5 (B-60) baggage cars for the Lines East of Pittsburgh.

IRON AND STEEL

THE NORTHERN PACIFIC has placed an order for 680 tons of bridge steel.

THE CHESAPEAKE & OHIO has ordered 3,000 tons of rails from the Pennsylvania Steel Company.

THE DELAWARE & HUDSON has ordered 14,000 tons of rails from the Bethlehem Steel Company.

THE TRANSIT DEVELOPMENT COMPANY (Brooklyn Rapid Transit) has ordered 1,000 tons of rails from the Bethlehem Steel Company.

TRACK SPECIALTIES

THE RUSSIAN GOVERNMENT has issued an inquiry for 14,000 tons of track fastenings.

SIGNALING

THE LOUISVILLE & NASHVILLE is to install automatic block signals on its line between Calera, Ala., and Montgomery, 63 miles.

AUSTRALIAN TRANSCONTINENTAL RAILWAY.—A good deal of interest has been taken in the long stretch of railway which is being built to link up the services of eastern and western Australia. The latest official report shows that the rails, earthworks and telegraph lines have been completed over 700 miles of the total distance of 1,050 miles to be constructed to connect Kalgoorlie with Port Augusta. The number of men employed was given as 2,265. On the South Australian side it is stated men were being attracted away by the work offering in the country for harvest and other purposes, and some difficulty had been experienced in keeping up the number of men and horses. The failure of contractors to supply boilers and locomotives to contract time and the need for overhauling existing locomotives were given as causes which had hampered the work of the eastern side. About six miles of the Trans-Australian line were constructed during one week, making a total of over 371 miles from the Kalgoorlie end.—*Railway Gazette, London.*

BRITISH ACCIDENTS IN 1915.—The past year has provided British railways with the biggest annual total of passengers killed in train accidents. The total is 269, and even if the Quintinshill disaster had not occurred the number would have been 44, a total which has only thrice been exceeded since 1874, the year in which the Royal Commission on Railway Accidents was appointed. The three occasions referred to were 1879, when 77 were killed, of whom 75 lost their lives in the Tay Bridge disaster; 1889, when the number was 96, of whom 88 were killed at Armagh; and 1906, when 58 were killed—24 at Salisbury, 11 at Grantham, 21 at Elliot Junction, and one each in two minor accidents. Of the 269 passengers killed during the past year 10 deaths occurred at Ilford, 2 at Kinsale, 3 at Smithy Bridge, 225 at Quintinshill, 10 at Weedon, 1 at Pollokshaws, 1 at Newark and 17 at Jarrow. In 1914 only six passengers were killed, and five of these lost their lives through the Baddengorm bridge being swept away by an unprecedented flood.

GERMANS BUILDING RAILWAYS IN COURLAND.—Refugees arriving at Riga furnish details of the conditions in Courland under the German occupation. Mitau has suffered comparatively little, but the station building has been destroyed. On entering the town the Germans lost no time in repairing the railway. The gage of the Libau-Romny line has been adapted for German cars, and as early as September the line as far as Mitau was in working order. The blown-up bridges had been temporarily replaced by wooden ones, but iron bridges are now being built, though wooden structures cross the Rivers Aa and Eckau. Traffic has been opened in the direction of Olai. The Courland railways now working include the Libau-Muravievo-Mitau and the Libau-Hazenpoth lines. The Germans have not repaired the Windau-Tuckum-Mitau line. From Mitau trains go as far as Tauerkaln, and a direct narrow-gage railway has been built between Memel and Prekult. In the Kovno Province a narrow-gage line has been constructed from Tauroggon to Shavli, which, it is said, will be extended to Bausk.—*Railway Gazette, London.*

Supply Trade News

E. C. Waldvogel, assistant general manager of the Yale & Towne Manufacturing Company, has been appointed general manager.

A. E. Schafer, for the past two years vice-president and general sales manager of the Flint Varnish Works, Flint, Mich., has severed his connection with that company.

Flint & Chester, Inc., New York have opened an office in the Peoples' Gas building, Chicago, from which they will handle in the west the National Graphite Lubricators for which the company is general sales agents in the United States and Canada. D. J. Lewis has been appointed manager of the Chicago office, effective February 1.

The Vanadium-Alloys Steel Company, of Pittsburgh and Latrobe, Pa., advises that it is installing an additional 30-pot crucible furnace. The company reports that although it has more than quadrupled its business during the past nine months, the demand for its products is so great that a plan for continuous enlargement will no doubt become necessary.

Paul Sutcliffe has been appointed advertising manager of the Edison Storage Battery Company, Orange, N. J. Mr. Sutcliffe joined the Edison interests in 1912, but resigned at the end of a year to become secretary of the W. S. Hill Advertising Company, Pittsburgh, Pa. He has been in the advertising department of the Edison Storage Battery Company for the past year.

The National Carbon Company, Cleveland, Ohio, announces that it has added to the sales force of its railway department, E. L. Marshall, for several years engaged in laboratory and research work for the company and Walter R. Pfisterer, for several years chief clerk in the signal department of the Rock Island lines at Chicago and more recently with the sales department of the Yale & Towne Manufacturing Company.

The Q. & C. Company, New York, has acquired exclusive control for the United States and Canada, with the exception of the states of California and Oregon, of the Magnetic Wig Wag Crossing Signal, owned by the Railway Specialties Company, Los Angeles. The device will be manufactured and sold by the Q. & C. Company under the name of the Q. & C. Magnetic Wig Wag. The device is the only magnetic wig wag on the market.

David A. Crawford, who has been elected treasurer of the Haskell & Barker Car Company, Inc., New York and Michigan City, Ind., was born at St. Louis, Mo., on April 1, 1880. He attended the public and high schools at Tuscaloosa, Ala., and graduated from the University of Wisconsin with the degree of bachelor of arts in 1905. He remained at the university as an instructor until 1907, when he came to Chicago to become private secretary to E. F. Carry, vice-president of the American Car & Foundry Company. In 1912 he was elected assistant secretary of the American Car & Foundry Company, and continued in that position until January 13, 1916, when he was elected treasurer of the Haskell & Barker Car Company, Inc.



D. A. Crawford

Isaac M. Cate, of Baltimore, a stockholder of the American Locomotive Company, has issued another circular to the other shareholders containing an analysis of the company's earnings since its organization. The circular touches upon the stock

transactions between the company and Harvey Fisk & Sons and goes into details concerning the losses sustained in the manufacture of automobiles and bonuses paid to officers.

An item in the Wall Street Journal of January 27 contains the following: After several months' negotiations the Canadian Car & Foundry Company has arranged to finance its \$145,000,000 war contracts by forming a committee of five, which probably will include Col. Dunn, of the U. S. Army; J. P. Murry, legal representative of the Russian Shell Committee, and three others, who will be members of the Canadian Car & Foundry Company of Canada. The money necessary to finance the work will be forthcoming from the Russian government.

John E. Dixon, who has recently assumed his duties as vice-president in charge of sales of the Lima Locomotive Corporation, was from February, 1907, until his election to his new position, assistant manager of sales of the American Locomotive Company. Mr. Dixon was born at Milwaukee, Wis., September 11, 1877. He received his education in the common and high schools of that city and at the University of Wisconsin, from which he graduated in 1900 with the degree of mechanical engineer. In the fall of 1900 he entered the employ of the Brooks Works at Dunkirk, N. Y., and served his time in the shops and drawing office. He was later for a while in the mechanical engineer's office, but then went back to the shops, first as foreman of the cylinder shop, then as assistant general machine shop foreman and finally general inspector for the Brooks Works. He was transferred to New York in 1905 and made a salesman of the Atlantic Equipment Company, a subsidiary of the American Locomotive Company. He later became manager, but in February, 1907, was transferred to the sales department of the American Locomotive Company as assistant manager of sales as above noted. As vice-president in charge of sales of the Lima Locomotive Corporation, Mr. Dixon will have headquarters at 50 Church street, New York.

Charles A. Liddle, who has been elected vice-president of the Haskell & Barker Car Company, Inc., was educated in the Philadelphia public schools and commenced his business career as an employee of the Allison Manufacturing Company, of Philadelphia, Pa., builders of freight cars and manufacturers of boiler tubes. Except for a short interval, he has been identified with the car manufacturing business ever since that time, having been successively in the service of the Jackson & Sharpe Company and the Harlan & Hollingsworth Company, at Wilmington, Del., and the Pressed Steel Car Company, at Allegheny, Pa. Since 1901, he has been connected with the American Car & Foundry Company, first as an engineer and later as assistant to the vice-president and general manager, with office at Chicago, which position he has just resigned.



J. E. Dixon



C. A. Liddle

J. H. Guess, who has recently been elected secretary and treasurer of the Lima Locomotive Corporation, was from January, 1912, until recently, general purchasing agent of the Grand Trunk. Mr. Guess was born near Raleigh, N. C., on February 5, 1878. He began railway work as a telegraph operator in 1895, on the Seaboard Air Line. From May, 1900, to February, 1901, he was clerk to the vice-president and general manager of the Seaboard Air Line, and from February, 1901, to March of the following year was clerk to the vice-president and general manager of the Atlanta, Birmingham & Atlantic. He was appointed assistant general purchasing agent of the National Railroad of Mexico in March, 1902, and in 1905 was made also assistant secretary and assistant treasurer of that company. From September, 1905, to September, 1910, he was general purchasing agent of the National Railroad of Mexico, and its successor, the National Railways of Mexico. Mr. Guess went to the Grand Trunk as assistant general purchasing agent in 1910, and in January, 1912, was promoted to the position of general purchasing agent as above noted. In addition to being secretary and treasurer of the Lima Locomotive Corporation, Mr. Guess will also be in charge of purchases. His headquarters will be at Lima, Ohio.

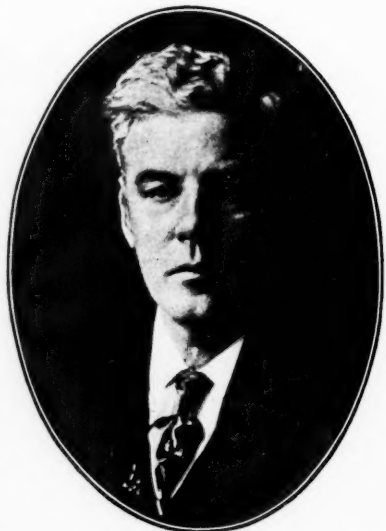


J. H. Guess

JOHN ALEXANDER HILL

John A. Hill, president of the Hill Publishing Company, died suddenly of heart failure on January 24, while in an automobile on his way from his home in East Orange, N. J., to his place of business in New York City. Mr. Hill was only 57 years of age; he was born February 22, 1858, at Sandgate, near Bennington, Vt. His parents moved to central Wisconsin and settled at Mazomanie when he was still a boy. He received only a country school education, and at 14 years of age went to work in a country printing office, of which he became foreman three years later. He was also half owner of a machine shop. At 20 he spent about a year prospecting and roughing it in the lead district. He then became a fireman on the Denver & Rio Grande and after a year was made an engineer. In his spare moments he took the opportunity of studying railway work and mechanics and occasionally, beginning in 1885, contributed articles to the railway engineering department of the American Machinist. In 1887 the publishers of that paper, desiring to broaden out into a new field, started the Locomotive Engineer. Mr. Hill was invited to New York to become its editor, but after three and a half years in that position he, in company with Angus Sinclair, bought the paper and renamed it Locomotive Engineering.

The new paper was a success from the start and two notable series of stories that appeared in it and attracted great attention



John A. Hill

were "Jim Skeever's Object Lessons" and "Stories of the Railroad," both of which were afterwards reprinted in book form. Mr. Hill at this time also published "Progressive Examinations for Locomotive Engineers," later adopted by the Master Mechanics' Association as a standard form of examination.

In 1896 the publishers of Locomotive Engineering, desiring to try their hand at a broader field than their paper would permit, acquired the American Machinist. A year later Mr. Hill sold his interest in Locomotive Engineering to his partner, Mr. Sinclair, and became the sole owner of the American Machinist itself. In 1902 he further extended his activities and purchased Power, which at that time was a monthly journal devoted only to the field of power transmission. The paper was at once changed to its present form and in 1908 it became a weekly. In 1905 the Engineering and Mining Journal was acquired, and in 1911 Coal Age was established to cover a field which was too large to be reached successfully by the Engineering and Mining Journal alone. The Engineering News, the fifth paper now owned by the Hill Publishing Company, was acquired in 1912. In the meantime, in 1900, a British company was formed to publish a European edition of the American Machinist. The continued growth of that paper also led its publishers to establish in 1909 the Deutscher Hill Verlag, A. G., which publishes Maschinenbau, a German edition of the paper.

One of the achievements of which Mr. Hill was proudest, however, was the building at Tenth avenue and Thirty-sixth street, which was completed in the latter part of 1914 and now houses the offices and printing plant of the five Hill publications.

Mr. Hill was recognized by all as one of the leaders and big men of the technical publishing field. It was owing to his initiative that many of the things that now give the technical papers their present standing were brought about. He was by nature modest, but he had the winning qualities of being genial, fond of good companionship, a man of force and character. The present high standing of the Hill Publishing Company, which he founded, is the best evidence of his creative and organizing ability.

The formal transfer of the Haskell & Barker Car Company to the new owners has taken place, and the following officers have been elected: Edward F. Carry, president and general manager; C. A. Liddle, vice-president; Arthur Van Brunt, vice-president; D. A. Crawford, treasurer, and A. J. McAllister, secretary. The main offices of the company will continue to be at Michigan City, Ind., but a sales office will be opened in the Railway Exchange, Chicago, on February 1, and Messrs. Van Brunt and McAllister will have headquarters at 5 Nassau street, New York City.

John E. Dixon, assistant manager of sales of the American Locomotive Company, has been elected vice-president in charge of sales of the Lima Locomotive Corporation, and J. H. Guess, until recently general purchasing agent of the Grand Trunk, has been elected secretary and treasurer. The Lima Locomotive Corporation was recently acquired, as noted in the *Railway Age Gazette* of January 14, by a syndicate headed by Joel S. Coffin, president, and Samuel G. Allen, vice-president of the Franklin Railway Supply Company. In addition to the officers mentioned it is currently reported that A. W. Wheatley, president of the Canadian Locomotive Company, Kingston, Ont., will be elected president of the Lima company. Joel S. Coffin has been elected chairman of the board of the company and Mr. Allen is one of the directors. Sketches and photographs of both Mr. Coffin and Mr. Allen appeared in the *Railway Age Gazette* of April 9, 1915.

TRADE PUBLICATIONS

LOCOMOTIVE APPLIANCES.—Bulletin No. 200, recently issued by the Franklin Railway Supply Company, New York, describes and illustrates the Franklin No. 8 butterfly type fire-door.

LIGHTING AND HEATING BURNERS.—The Alexander Milburn Company, Baltimore, Md., has recently issued a twelve-page booklet describing and illustrating the Wells Light and Heating Burner. This burner, which until June, 1915, was handled by the Wells Light Manufacturing Company, Jersey City, N. J., burns kerosene oil and is adapted for contractors, railroads, industrial plants, foundries, shipyards, etc.

Railway Construction

BIRMINGHAM, COLUMBUS & ST. ANDREWS.—This company has been given permission to issue \$200,000 of receiver's certificates, it is said, also to build new lines. It is understood that the company has under consideration the question of building extensions from Chipley, Fla., north to Graceville, 12 miles, and from Southport to Bunkers Cove, 23 miles. The company now operates a line from Chipley south to Southport, 38 miles.

CHESAPEAKE & OHIO.—This company is enlarging the receiving yard at Newport News, Va. The plans call for 8 tracks, each 4,500 ft. clear length. The grading work has been finished and track laying is now under way. There are about 6 miles of track yet to be laid.

FAIRMONT-BINGAMON.—Incorporated with \$400,000 capital to build a line from a point on the Baltimore & Ohio at or near Hutchinson, Marion county, W. Va., west to Wyatt in Harrison county, about 8 miles. The incorporators include M. C. Byers, C. H. Porter, J. T. Middleman and H. V. Fleagle, all of Baltimore, Md.

MIDLAND & NORTHWESTERN.—A charter has been granted recently to this company in Texas with \$60,000 capital. The plans call for building a railway from Midland, Texas, northwest to Seminole in Gaines county, about 65 miles. A contract for the grading work was let last year to J. A. Hunter, Strawn, Texas. T. J. O'Donnell, president and G. W. Thaxter, chief engineer. (October 29, p. 828.)

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has authorized the Interborough Rapid Transit Company to award construction contracts to the lowest bidders upon certain lines in the borough of the Bronx, as follows: For the Webster avenue extension of the Third avenue elevated railroad, to M. J. Leahy, for \$831,110; for the Eighth avenue and one-hundred and sixty-second street connection, to the Battery Engineering & Construction Company, for \$336,784; for the West Farms subway connection, to A. L. Guidone & Son, Inc., for \$105,791. These bids, with others, were received by the company on January 10 and submitted to the commission for consideration.

The New York Public Service Commission, First district, is readvertising for bids, to be opened on February 10, for the construction of Section No. 2-A of Route No. 12. This section is a part of the Broadway-Fourth Avenue Rapid Transit Railroad in the borough of Brooklyn. (December 31, p. 1262.)

ROCKCASTLE RIVER.—According to press reports, plans are being made to build an eight-mile extension from Bond, in Jackson county, Ky., to timberlands. Surveys for the extension have already been started. The company now operates a line from a connection with the Louisville & Nashville at East Bernstadt, to Bond, 16 miles.

ROSEBURG & EASTERN.—Organized to build a railway from Roseburg, Douglas county, Ore., to a point on the North Umpqua river about 15 miles northeast of Roseburg, and thence in an easterly direction 18 miles to the western boundary of the Umpqua national forest. Grading work will be begun some time this coming spring. S. A. Kendall, president, Pittsburgh, Pa.; F. M. von Planta, chief engineer, Roseburg, Ore.

SOUTHERN RAILWAY.—This company has started work on an extension of the Tennessee & Carolina Southern now in operation from Maryville, Tenn., south thence east to Chilhowee, 25.2 miles. Some years ago grading work was carried out on about 11 miles beyond Chilhowee but no rails were laid. This grade will now be put in shape for track laying. A contract has been let to the Oliver & Hill Construction Company for the new roadbed from the above grade following the Little Tennessee river to the mouth of the Cheoah river, about three miles. This work is being undertaken in connection with electric power development to be made on the Little Tennessee river by the American Aluminium Company.

TENNESSEE & CAROLINA SOUTHERN.—See Southern Railway.

WESTERN MARYLAND.—The contract recently let by this company to the Caliborne Johnston Company, Baltimore, Md., is

for grading work on about three miles connecting Blue Mountain, Md., and Edgemont passing sidings. The work will be light, and will be located along the present main track. The railroad company will carry out the track laying with its own forces. (January 21, p. 148.)

RAILWAY STRUCTURES

ALBUQUERQUE, N. M.—Final plans and specifications are being prepared by the Atchison, Topeka & Santa Fe for a new blacksmith shop here. It will be a steel-frame, brick structure with metal sash windows, 30 ft. long by 80 ft. wide, to cost approximately \$60,000.

COSTER, TENN.—The Southern Railway will provide a special shop for repairs to steel cars at the Coster shops near Knoxville. The new facility will consist of an all-steel main shed 73 ft. by 480 ft. with three tracks extending through same and a workshop 51 ft. by 100 ft., both to be equipped with overhead power cranes and full complement of machinery and tools for repairing steel cars.

A contract for the construction of the steel frame for the main shed has been let to the Virginia Bridge & Iron Company and the material will be fabricated at the Memphis plant. Construction will begin before April 1 and will be completed within six weeks. Other additions to be made to the facilities at Coster shop will include a scrap dock with reclaiming shop for handling and reclaiming future accumulations of scrap resulting from repairs to cars and an additional wash and locker room for the use of employees. The erection of these buildings will necessitate a revision of the track layout at the north end of the yard. With the exception of the steel frame for the steel car repair shed all construction will be carried out by company forces.

MADISON, N. C.—A contract has been given by the Southern Railway to the Palmer-Spivey Construction Company, Augusta, Ga., for the construction of a frame combination station at Madison.

NEW YORK.—The New York Public Service Commission, First district, has approved an agreement between the Interborough Rapid Transit Company and the New York Central for the joint use of the Putnam division bridge over the Harlem river at Eighth avenue and One Hundred and Fifty-fifth street. The approved agreement gives the Interborough Company the right to extend the line of the Sixth and Ninth avenue elevated railroad over the bridge and through One Hundred and Sixty-second street to a connection with the Jerome avenue branch of the Lexington avenue subway, the contract for which has also been approved by the commission. The New York Central will construct a new station, for the joint use of both companies, at or near the easterly end of the bridge, which is to be the southerly terminus of the Putnam division and ultimately the present station at or near One Hundred and Fifty-fifth street, now used by the Central, will be abandoned.

PAWTUCKET, R. I.—The New York, New Haven & Hartford plans to carry out improvements to the freight facilities at Pawtucket as follows: Rearrangement of all tracks in the south yard at Pawtucket; moving of old freight house to new location; construction of new outbound brick freight house 30 ft. by 170 ft. and a two-story brick office building 30 ft. by 40 ft., including concrete platforms, paved driveways, etc. A contract for building the new outbound freight house, office building and concrete platform has been let to Charles W. Murdock, and this work is to be completed by the latter part of April, next. The company expects to start work this spring on the revision of the yard tracks.

ST. PAUL, MINN.—Plans are practically complete for a new office building for the Chicago, St. Paul, Minneapolis & Omaha on the site of the present offices. It will be a fireproof steel-frame structure, 128 ft. by 99 ft., 8 stories high, faced with Bedford stone on the first story and brick for the other stories. Estimated cost, \$400,000. Architect, C. S. Frost, Borland block, Chicago, Ill.

TOPEKA, KAN.—Plans for a blacksmith shop for the Atchison, Topeka & Santa Fe have been completed, providing for a steel-frame, brick structure, 100 ft. by 150 ft., with metal sash windows. The estimated cost of the building is about \$40,000. A crane runway 230 ft. by 60 ft. will also be built.

Railway Financial News

CHESAPEAKE & OHIO.—Kuhn, Loeb & Co. and the National City Bank, both of New York, bought from the Chesapeake & Ohio and resold on the same day \$3,160,000 4½ per cent equipment trust certificates.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has asked the Wisconsin railroad commission for authority to issue \$5,369,000 bonds to be exchanged for the Idaho & Washington Northern, a subsidiary.

All of the bonds, said to be approximately \$30,000,000, of the Chicago, Milwaukee & St. Paul which were offered by Kuhn, Loeb & Co., and the National City Bank, both of New York, and which are secured by the deposit of an equal face amount of bonds issued in francs and now stamped payable in gold only in New York, have been subscribed for.

CHICAGO, ROCK ISLAND & PACIFIC.—W. J. Matheson and W. Emlen Roosevelt have resigned as directors.

Judge Hough has authorized the receiver of the Chicago, Rock Island & Pacific to pay the interest due January 3 on the receiver's certificates and to make a new issue of certificates to redeem the old certificates which matured on that date. The new certificates bear interest at 5 per cent and mature July 3, 1916.

FITCHBURG RAILROAD.—This company has sold to a syndicate of Boston bankers \$1,359,000 one-year 5 per cent notes, dated February 1, 1916.

INTERNATIONAL & GREAT NORTHERN.—The receivers have instituted a suit against the tax collector of each county through which the road passes to enjoin the collection of taxes on intangible assets, the receivers claiming that the company has no intangible assets.

NEW YORK CENTRAL RAILROAD.—The court of appeals of New York has found that the issue of the New York Central Lines equipment trust certificates of 1913 was valid and has dismissed the suit brought by C. H. Vener, as a minority stockholder, to adjudge this equipment trust agreement illegal.

SOUTHERN RAILWAY.—The Wall Street Journal says that the Southern Railway may temporarily borrow from J. P. Morgan & Co., New York, the entire amount required to pay off its \$5,000,000 3-year 5 per cent notes, due February 1, pending arrangements for permanently financing this capital obligation.

WHEELING & LAKE ERIE.—For the fifth time there were no bids put in at the sale of the Wheeling & Lake Erie under foreclosure. March 8 has been fixed for the date of the next sale.

ITALIAN DOCK WORKERS.—A decree has been issued authorizing the Italian government to place under military jurisdiction the persons engaged in the commercial life of the ports. The step is taken with a view to organizing and speeding up work at the ports, especially the loading and unloading of war material and the necessities of life.

THE RAILWAYS OF SOUTH AUSTRALIA.—South Australia possesses a considerable mileage of railway of two gages, 5 ft. 3 in. and 3 ft. 6 in. Making an early start with its railways, it adopted the same gage (5 ft. 3 in.) as the neighboring state of Victoria for most of its main lines. Later on it adopted the 3 ft. 6 in. gage in the extension of its main lines northwards and for all secondary lines. The state still continues, however, to build railways on the 5 ft. 3 in. gage, some 177 miles on that gage having been opened for traffic during the year ending June 30, 1915, bringing the total length of broad-gage lines up to 970 miles, which have cost (exclusive of rolling stock) \$33,500 a mile on the average. The length of 3 ft. 6 in. gage line is 1187 miles, of which 134 miles were opened during the year, the average cost of construction of the narrow-gage lines being about \$19,000 a mile. For the system as a whole the cost of construction has averaged \$25,000 a mile, exclusive of equipment, workshops and certain station buildings and depôts. Including these items, the cost of open lines has averaged \$39,000 a mile.